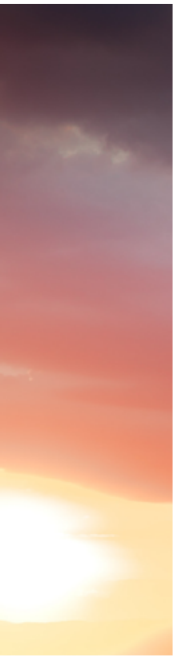
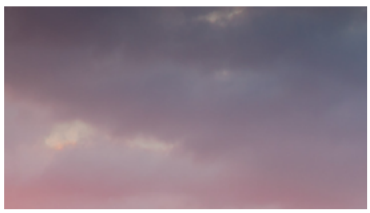
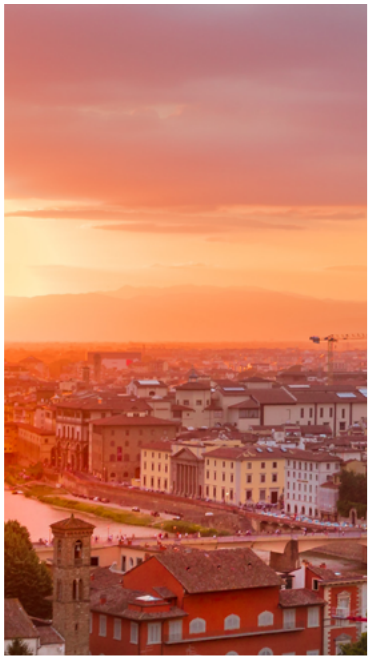
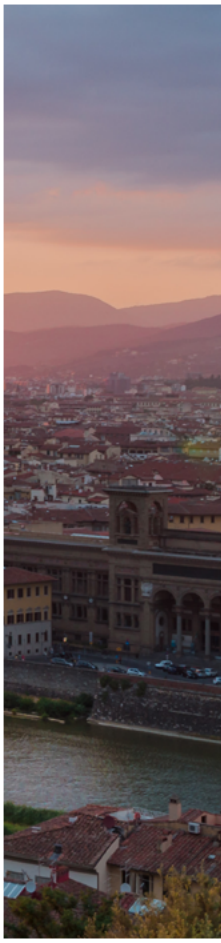
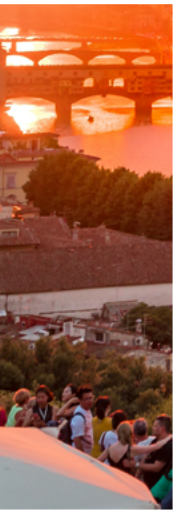
2026
ITALY | FLORENCE
MAY13-15

ESPHM
17th EUROPEAN SYMPOSIUM
OF PORCINE HEALTH MANAGEMENT

PROCEEDINGS

May 13-15, 2026
Florence, Italy

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WELCOME LETTER

Dear Colleagues,

On behalf of the Local Organizing Committee, it is our great pleasure and honor to welcome you to the 17th European Symposium of Porcine Health Management (ESPHM), which will be held from 13 to 15 May 2026 in the beautiful city of Florence, Italy.

We are delighted to host colleagues from around the world in Italy for the most important European event devoted to porcine health management. Many of you will remember the 6th ESPHM held in Sorrento in 2014 — an edition still fondly recalled for its outstanding scientific content and unforgettable social programme. Inspired by that success, we are committed to making ESPHM 2026 an equally memorable and enriching event.

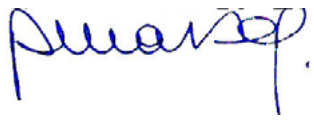
Florence in May offers an ideal setting: mild temperatures, blue skies, and an atmosphere full of art, history, and vibrant Italian culture. As the cradle of the Renaissance, Florence embodies Italian creativity, beauty, and inspiration — the perfect backdrop for a dynamic and insightful symposium.

Over the years, ESPHM has evolved into one of Europe's leading veterinary events, drawing a diverse international audience of veterinarians, researchers, industry professionals, and policymakers. The 2026 edition will carry on this proud tradition with a comprehensive scientific programme featuring world-renowned speakers, parallel sessions, roundtable discussions, and countless opportunities for networking and knowledge exchange.

The venue, Fortezza da Basso, is a historic landmark of Renaissance military architecture, conveniently located in the heart of Florence — just steps from the central railway station and close to the accommodations selected for the delegates.

We are confident that ESPHM 2026 in Florence will provide an outstanding scientific experience as well as a unique opportunity to immerse yourself in the rich artistic and cultural heritage of Italy!

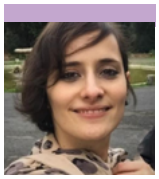
We look forward to welcoming you to Florence and to sharing with you what promises to be an unforgettable symposium.



Prof. Paolo Martelli
Chair of the 17th European Symposium of Porcine Health Management

LOCAL ORGANISING COMMITTEE

Paolo Martelli
Head of LOC and Chair of ESPHM 2026, University of Parma



Elena Canelli
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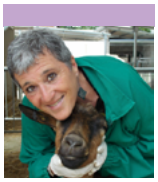

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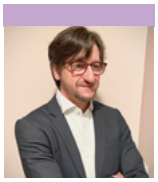

Andrea Luppi
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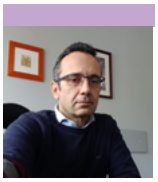

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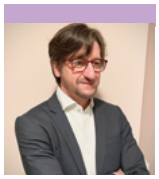

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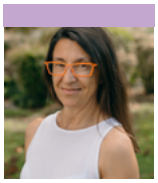

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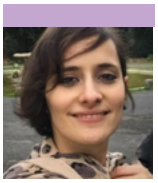

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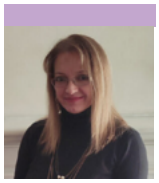

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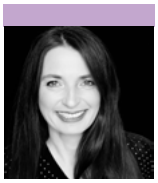

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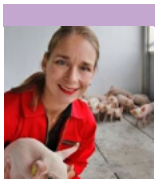

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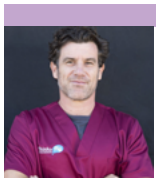

Antonio Vela Bello
ThinkinPig

THE EUROPEAN COLLEGE OF PORCINE HEALTH MANAGEMENT **ECPHM**

ECPHM EUROPEAN COLLEGE OF PORCINE HEALTH MANAGEMENT

www.ecphm.org

The ECPHM is a non-profit organization under the umbrella of the European Board of Veterinary Specialization (EBVS). EBVS **recognises and monitors** veterinary speciality Colleges in Europe. It defines **guidelines for the recognition and registration** of specialists in areas of veterinary medicine in Europe, and maintains an **updated register** of European Veterinary Specialists.

EBVS encourages and promotes the enhanced utilization and availability of veterinary specialist services to the public and the veterinary profession.
The ECPHM works for the advancement of health and welfare oriented porcine production management in the herd context in Europe, and the increase of the competency of those who practice in this field.

The major **objectives** of the ECPHM include:
• Establishing guidelines and standards of training for postgraduate education and experience prerequisite to become a veterinary specialist in the specialty of porcine health management;

• Examining and authenticating veterinarians as specialists in porcine herd health management to serve health and welfare of the animals, the economic outcome of the herd, and the production of safe quality product for consumers in a sustainable animal production by providing expert care for pigs;

• Encouraging research and other contributions to the science and practice of porcine herd health management including husbandry, reproduction, epidemiology, pathogenesis, diagnosis, therapy, prevention, and control of diseases directly or indirectly affecting pigs and the maintenance of healthy and productive pig herds;

• Porcine health management also includes the impact on quality and safety of pork and gives special consideration to herd health and production, production systems and targets, and the management of pig populations;

• Providing high scientific standards and continuous training on porcine health and management;

• Promoting communication and dissemination of knowledge.

The ECPHM is organized through different bodies that take care of the **different activities performed:**
• the Board represents the College and is its main government body;

• the Education Committee organizes educational events for the ECPHM residents, including the e-learning sessions, the pre-symposium workshop and the summer school. The Education Committee also approves Resident training programs;

• the Examination Committee prepares the annual exam and arranges the examination of residents;

• the Credentials Committee reviews and approves the applications for admittance to the residency program, as well as the applications to sit the exam, and review applications for recertification of the Diplomates;

• the Nominations Committee manages and reviews the proposals for nominations in the different committees and board;

• the ECPHM activities are supported by a permanent Administrative Secretariat in Parma, Italy.

THE EUROPEAN SYMPOSIUM OF PORCINE HEALTH MANAGEMENT **ESPHM**

www.esphm2026.org

The first ESPHM was organized by the ECPHM in 2009 in Copenhagen (Denmark). Subsequent meetings were organized in Hannover (Germany) and Helsinki (Finland). After the creation of the European Association of Porcine Health Management (EAPHM) in 2010, the following symposia were organized in a three-party fashion, involving the EAPHM, the ECPHM and the local organizers until ESPHM 2021.

ESPHM 2009 Copenhagen (Denmark)
ESPHM 2010 Hannover (Germany)
ESPHM 2011 Helsinki (Finland)
ESPHM 2012 Bruges (Belgium)
ESPHM 2013 Edinburgh (United Kingdom)
ESPHM 2014 Sorrento (Italy)
ESPHM 2015 Nantes (France)
ESPHM 2016 Dublin (Ireland) co-organized with IPVS
ESPHM 2017 Prague (Czech Republic)
ESPHM 2018 Barcelona (Spain)
ESPHM 2019 Utrecht (The Netherlands)
ESPHM 2021 Virtual Symposium
ESPHM 2022 Budapest (Hungary)
ESPHM 2023 Thessaloniki (Greece)
ESPHM 2024 Leipzig (Germany) co-organized with IPVS
ESPHM 2025 Bern (Switzerland)

By means of this organizational formula, the ESPHM has been held so far in various European Countries.

The 17th edition will be held in 2026 in Florence (Italy) and is jointly organized by the European College of Porcine Health Management (ECPHM), a renewed council of European pig practitioners (Veterinary Practitioner Council, VPC) and the Local Organizing Committee (LOC).

The symposium philosophy consists of **mounting a sound program**, with **cutting-edge scientific-technical knowledge, practically oriented**, which is able to catch the attention of swine veterinarians all over Europe, but with full international vocation.

The symposium's content includes **invited lectures of recognized experts**, as well as **oral communications, flash talks and poster presentations**. Importantly, the ESPHM is an excellent platform for introducing the ECPHM Residents into the scientific world, by presenting their studies (Resident oral communication sessions) and participating in the College activities organized around the symposium (e.g., Resident workshop).

In addition, the ESPHM must serve as a **vehicle for potentiating networking among pig veterinary professionals all around Europe**, and emphasize the global character of a borderless profession. Also, Annual General Meetings of the ECPHM are organized within the program of the symposium, and facilitate that the critical mass of the college can join together once a year.

PORCINE HEALTH MANAGEMENT
PHM

https://porcinehealthmanagement.biomedcentral.com/

Porcine Health Management (PHM) is an open access peer-reviewed journal that aims to publish relevant, novel and revised information regarding all aspects of pig health medicine and production. The journal provides a venue for global research on pig health and production, including infectious and noninfectious diseases, reproduction, epidemiology, management, economics, genetics, housing, nutrition, animal welfare and ethics, legislation, food safety, drugs and surgery. This journal is aiming at readers, and attracting authors, with different levels of experience; Diplomates and Residents of the ECPHM and other colleges as well as PhD students and experienced researchers from outside!

Anticipated articles include: original research, reviews, short communications, case reports, case studies and commentaries.

The Editors-in-Chief are **Heiko Nathues** (University of Bern, Switzerland) and **Nicolas Rose** (French Agency for food, environmental and occupational health and Safety (Anses)).

Porcine Health Management – 2025 Highlights
Advancing excellence in swine health, welfare and production medicine

- **Journal Impact Factor: 3.1**
- **CiteScore: 5.7**
- **Median time to first decision: 5 days**
- **491.2k downloads in 2025**
- **49 articles published in 2025**
- **Fully Open Access**
- **Official journal of the ECPHM**
- **International editorial board with global expertise**
- **Key topics in 2025: PRRSV, PCV2, influenza A, antimicrobial stewardship, pig welfare, precision livestock farming, reproduction and zoonoses**

Please use the online submission system to submit your manuscript. For all enquiries about the journal, technical issues, payment of article processing chargers (APCs), etc. please contact: porcinehealthmanagement@biomedcentral.com.

There are many reasons to publish in PHM:
• Fast, fair, and expert peer-review
• High visibility through open access
• Indexed in PubMed, Scopus, and Web of Science
• Official journal of the European College of Porcine Health Management (ECPHM)

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BOEHRINGER INGELHEIM

Boehringer Ingelheim provides innovation for preventing and treating diseases in animals. The company offers a wide range of vaccines, parasite-control products, and medicines for pets, horses, and livestock to veterinarians, animal owners, farmers, and governments. As a global leader in the animal health industry and a family-owned company, we take a long-term perspective. The lives of animals and humans are interconnected in deep and complex ways. We know that when animals are healthy, humans are healthier too. By using the synergies between our Animal Health and Human Pharma businesses and by delivering value through innovation, we enhance the health and well-being of both.
For more information visit: https://www.boehringer-ingelheim.com/animal-health

CEVA SANTE ANIMALE

Ceva is a research-driven global animal health company dedicated to supporting veterinary professionals and animal caretakers worldwide. Operating in 47 countries and active in more than 110 markets, Ceva employs over 7,000 people and relies on a strong industrial and scientific footprint, with 21 R&D centers and 33 production sites. Its approach goes beyond products, combining equipment, training, technical support, data analysis, and specialized services to ensure optimal and sustainable animal health solutions.
Ceva is a key partner for the swine sector, offering a broad portfolio of veterinary solutions designed to meet modern sanitary and zootechnical challenges. Significant investments in research and development have enabled the company to deliver innovative solutions, particularly in vaccines, reproduction, anti-infectives, and smart farming technologies.
As a Gold Sponsor of ESPHM 2026, Ceva highlights the strength of its swine portfolio, including Cirbloc M Hyo, a recently launched dual-action vaccine against Mycoplasma hyopneumoniae and PCV2, Forceris, an exclusive injectable combination of iron and toltrazuril, and the Ceva Lung Program, our unique service to monitor PRDC through lung lesion scoring at slaughterhouses.
Come and visit us on our booth #8

DOPHARMA

Dopharma is a family-owned veterinary pharmaceutical company with its headquarters in the Netherlands and produces high quality veterinary pharmaceuticals and offers diagnostic solutions for livestock since its establishment in 1969.
The product range includes antibacterial, anti-parasitic and anti-inflammatory products as well as hormone preparations, supporting pharmaceuticals, complementary feed and autogenous vaccines. All produced in one of the three productions sites in Europe and sold in more than 70 countries.
Dopharma has most disciplines under own management, including R&D, Regulatory Affairs, Manufacturing, Customer Service, Logistics, Technical Support and Sales & Marketing. Together we work towards clever and sophisticated solutions in order to achieve the best results possible, contributing to a healthy livestock.

Dedicated to livestock farming
Since the start, we are fully dedicated to livestock farming. While many pharmaceutical companies make a shift towards companion animals, Dopharma continues to invest in new swine product development. In 2023 we launched Fludosol for swine using a unique patented nano suspension technique and this year we are delighted to offer you Phenoxypen® (phenoxymethylpenicillin): the targeted solution for a smarter Streptococcus suis strategy.

COMPANY PROFILE
SPONSORS

HIPRA

HIPRA is a biotechnological pharmaceutical company focused on prevention for animal and human health, with a broad range of innovative vaccines. With its claim “Building immunity for a healthier world”, HIPRA affirms its commitment to contributing with solutions that improve global health.
HIPRA has a solid international presence in more than 40 countries, with its own subsidiaries, 3 R&D centres and 6 manufacturing centres strategically located in Europe (Spain) and America (Brazil).
Moreover, its international distribution network keeps open marketing channels with nearly 100 other countries, thereby covering the 5 continents.
Research and Development constitute the core of its knowledge. HIPRA dedicates over 15% of its annual turnover to R&D activities. To give added value to its vaccination experience, the company also develops medical devices and traceability services.
HIPRA carries out and monitors all stages of the production of its biological products and services at its facilities, which are equipped with the latest technological advances. In this way, it is the company that has launched the highest number of biotechnological vaccines in the last 10 years, with more than 20 vaccines.
HIPRA is ranked 5th of the global leaders in the veterinary industry developing vaccines for Animal Health.

HUVEPHARMA

Huvepharma is a fast-growing, global pharmaceutical and nutritional company which celebrated 25 years in the animal health and nutrition industry in 2025. We are well-known for our expertise in fermentation and as a fully integrated company, we have complete control over the entire production process from strain to shelf. Through meeting the everyday and long-term needs of our customers, our aim is to empower feed mills, integrators, and veterinarians to optimise the performance of all livestock animals. Today we are one of the top ten global pharmaceutical companies. Across more than 90 countries on six continents, we shape livestock solutions for customers across terrestrial and aqua species. Our team consists highly skilled individuals with extensive industry experience and deep local knowledge. Our growth is both organic and through acquisitions, and we invest in R&D projects to discover future products, keeping our pipeline full. Our unique and broad product portfolio already includes coccidiostats, feed additives, enzymes, veterinary products, vaccines and biosecurity solutions as well as services such as Aviapp. For more information about Huvepharma solutions, please get in touch or visit our website www.huvepharma.com.

KEMIN

As the world’s population continues to grow, the demand for protein soars. Kemin is dedicated to developing ingredients that help producers raise healthy pigs. We offer the most comprehensive portfolio of high-quality and science-based services and solutions. These offerings proactively address bacterial, viral, parasitic, as well as toxin challenges for a profitable preventive strategy while committing to responsible use of medicines. They are backed by a team of experts, as well as rigorous quality and safety standards, to ensure our customers get the most out of every product. In this way, we strengthen animals and foster a healthy and sustainable business for you – our customers.

COMPANY PROFILE
SPONSORS

MSD ANIMAL HEALTH

At MSD Animal Health, we are committed to preserving and improving the health, well-being, and performance of animals. Central to our mission is the transformation of pig farming through innovative health solutions and advanced on farm technologies that promote the health and well being of pigs.Our comprehensive portfolio includes one of the broadest ranges of vaccines, health management solutions, and services available. We also offer an extensive suite of connected technologies, including identification, traceability, and monitoring products that further strengthen our commitment to animal health and well being.Swine Protect & Connect™ is our advanced and integrated Health Tech solution, designed to support the swine industry with efficacy, efficiency, and transparency. It brings together Porcilis® vaccines, where Porcilis® PCV M Hyo ID can be mixed with Porcilis® Lawsonia ID in a single vaccine application and used concurrently with Porcilis® PRRS to provide protection against four diseases in one vaccination event. These vaccines can be administered using our needle free, intradermal IDAL® device and full farm data can be captured to the individual pig via seamless integration with LeeO. By integrating these state of the art solutions, we empower veterinarians and farmers to embrace the future of pig farming.

MSD Animal Health

ZOETIS

Zoetis is the world's leading animal health company, driven by a singular purpose: to nurture our world and humankind by advancing care for animals. With a legacy of nearly 75 years, Zoetis continues to pioneer ways to predict, prevent, detect, and treat animal illness, supporting veterinarians, livestock producers, and pet owners in over 100 countries. We integrate deep scientific expertise, data-driven R&D, advanced manufacturing, and commercial excellence to deliver meaningful innovation across medicines, vaccines, diagnostics, biopharmaceuticals, and digital solutions. Guided by our vision to be the most trusted and valued animal health company, Zoetis is committed to setting new standards for the future of animal care through innovation, customer obsession, and purpose-driven colleagues.
Zoetis provides numerous health and wellness products and services for pigs. Our experts work with swine producers and veterinarians to help them make informed decisions to produce safe, high-quality pork. Our major products for pigs include vaccines CircoMax® Myco and CircoMax®, Suvaxyn® PRRS MLV, Draxxin®; and Improvac®. We also offer comprehensive education and training to those who work directly with pigs or that supervise pig caregivers.
Learn more: https://www.zoetis.com/products-and-science/livestock
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SILVER SPONSORS

BIOCHEK

Since 1997, BioChek has supported the poultry and swine industries with reliable diagnostic solutions that safeguard animal health, improve livestock productivity, and enhance food safety. BioChek offers smart veterinary diagnostic tools to monitor, safeguard, and manage animal health at the livestock level. Our solutions help maintain healthy flocks and herds, and enable veterinarians, farmers, and lab specialists to collaborate in a clear, data-driven manner. BioChek's head office is based in the Netherlands, with R&D departments in the UK and Germany, a USDA-licensed facility in the US, a regional office in South Africa, regional and local sales teams, and distributors worldwide.

BIOGÈNESIS BAGÒ

Biogénesis Bagó is a global leader biotechnology company in animal health, productivity, and welfare. The company develops, manufactures, and markets world-class products to protect animal health status. It plays a key role in preventing zoonotic diseases and ensuring food production safety. Biogénesis Bagó is recognized as a global leader in the prevention and control of foot-and-mouth disease and is one of the leading supplier of canine and feline rabies vaccine, with the capacity to respond immediately to animal health emergencies worldwide.

BRONZE SPONSORS

BIOVETA

Bioveta is the largest Czech manufacturer of veterinary medicines with more than a century of tradition. It is among the TOP thirty largest companies in this field worldwide. Thanks to its own research and development efforts, it is successful in developing cooperation with key global partners in the field of veterinary medicine. Bioveta has based its success on the quality and innovation of its products thanks to massive annual investments in technology and the development of production processes. The company sells more thany 200 products to more than 90 countries in Europe, Asia, Africa, America and Australia.

EXOPOL

With over 30 years of experience, Exopol is a leading laboratory specializing in advanced diagnostics and autogenous vaccines. Located in Europe's premier swine production hub, we provide unrivaled expertise in porcine health.
Driven by the high standards of our clients, we excel in precise pathogen characterization—the essential foundation for designing our superior autogenous vaccines. By integrating rigorous diagnostics with tailor-made biologicals, we empower swine veterinarians with the most effective tools to optimize herd performance.
Trust Exopol: where three decades of diagnostic precision meet the next generation of personalized vaccine solutions.

COMPANY PROFILE
SPONSORS

FATRO

FATRO was founded in Forlì in 1947, in a small veterinary pharmaceutical laboratory. Over the years, that laboratory evolved into a pharmaceutical group comprising several companies operating exclusively in the veterinary sector, dedicated to the research, development and production of drugs and vaccines for all animal species. FATRO exports its products to over 90 countries worldwide and has subsidiaries in Spain, Greece, Poland, the Czech Republic, Argentina, Uruguay, India, and, most recently, Turkey. Thanks to the work of over 950 employees, the company remains firmly rooted in Italy while maintaining a strong international presence.

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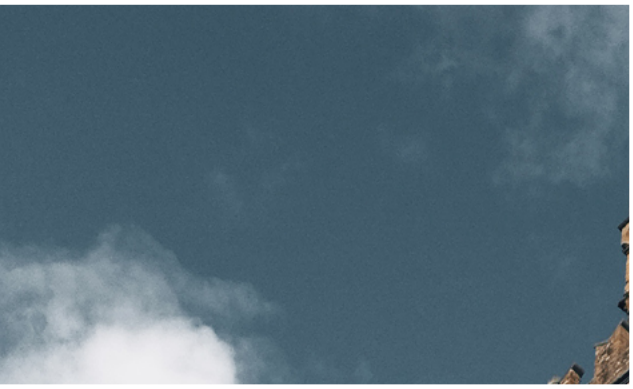

KEYNOTE LECTURES

KEYNOTE SESSION

INNOVATION FOR BUILDING TRUST IN THE PIG SECTOR

LIS ALBAN

"The Danish Model for collaboration in pig health and food safety – a way of co-creating the future"

Abstract

Introduction

Pig production is an area that many people have opinions about. Photos and footages showing diseased pigs provoke strong feelings, resulting in pressure on decision-makers. Although much can be done to prevent disease and alleviate other negative impacts, no pig raising system is perfect. Good housing and management are required, as well as skilled farm workers and regular input from pig vets and other professionals. Hence, adequate production come with a cost. However, consumers expect high-quality meat at affordable prices.

Denmark is a small country with a high level of societal trust, and a low level of corruption. It has 6 million inhabitants and a food production that can feed twice as many (Schou et al., 2016). Collaboration is deeply rooted in society and has among others enabled a strong, export-oriented livestock and meat sector. The Danish co-creation model reflects principles established historically for negotiations related to the labour market (Pedersen, 2023).

Applied to animal health and welfare (AHAW) and food safety, the model mainly includes the producers and abattoirs and their organisations, government agencies and academic institutions. The other Scandinavian countries also apply this model in their societies, but their livestock sectors are smaller than the Danish.

Biosketch

DVM, PhD. DipECVPH, DipECPHM (Non-Certified) Chief scientist, Danish Agriculture & Food Council Adjunct professor, University of Copenhagen

Lis Alban holds a DVM and a Ph.D. in veterinary epidemiology from University of Copenhagen, Denmark. Moreover, she is a Diplomate of the ECVPH and a Diplomate of the ECPHM (Non-Certified). Lis Alban is since year 2000 affiliated as a Chief Scientist with the Danish Agriculture & Food Council (DAFC). DAFC is an organization that represents the entire agricultural business of Denmark – from the farmers to the processing industry. At DAFC, she undertakes epidemiological investigations and is responsible for the conduct of risk assessments e.g., related to antimicrobial use, residues and resistance. Her main interest is surveillance and control of pig-borne hazards, and her work is used as support for decision-making. She is also an Adjunct Professor at the University of Copenhagen and in that role, she acts as a supervisor or co-supervisor for Masters' and PhD students. Her involvement in both academia and industry allows her to focus on identifying intelligent and cost-effective solutions to the challenges in current meat production. She prefers working using the Danish Model, which involves collaboration between stakeholders, academia and veterinary authorities.

The co-creation model has contributed to contingency planning, eradication programmes, action plans for zoonoses and antimicrobial stewardship programmes. The pig industry has established private standards and a diagnostic laboratory and taken responsibility for Salmonella surveillance and control, leading to a very low Salmonella prevalence in pig meat (Alban et al., 2012). Since its establishment in 1971, the SPF system is being run by the pig industry. Moreover, herd health advisory contracts are in place and enforced by legislation, requiring pig vets to make regular visits to pig farms. Examples of common activities also include negotiations with importing countries regarding equivalence acceptance for meat inspection and regionalisation in case of outbreak of African swine fever (ASF).

The collaboration is formalised through working groups and public–private partnerships. However, the model is increasingly being challenged. It is as if the achievements in the past regarding AHAW and food safety are no longer counting. New issues are receiving attention, such as climate impact and biodiversity. Moreover, old issues like antimicrobial use (AMU), piglet mortality, and tail docking are being increasingly criticized. To understand and react to the critique, an analysis was aimed for. Because the model might need adjustment to be functional also in the future.

Materials and Methods

A qualitative content analysis based on input from 17 purposively selected representatives of the Danish Veterinary and Food Administration, three Danish universities, and the Danish Agriculture & Food Council was made, revealing the strengths, weaknesses, opportunities and threats related to applying the model to AHAW and food safety questions. Focus was on interpretation of what the interviewees stated, in line with Grant and Giddings (2002).

Moreover, selected representatives within the Danish Agriculture & Food Council were interviewed specifically regarding the challenges related to AMU, piglet mortality, and tail docking.

Results

The strengths of the model included reduced duplication of work, efficient communication, high levels of expert knowledge, shared ownership and rapid response capacity. Collaboration drives data sharing and evidence-based approaches. Realistic and implementable solutions are found due to the involvement of the parties closest to practice. A current example is the PRRS reduction programme, which is showing strong progress (Bak et al., 2026).

The weaknesses included risks of perceived conflicts of interest, challenges to academic independence and potential echo-chambers due to close familiarity among participants. Moreover, the model can be time-consuming because of the often many meetings required to find consensus. Tail docking is an example of a subject where it initially was difficult to find solutions due to tensions between practical concerns, regulation and internal dynamics of the ownership structures of the abattoirs.

The opportunities consisted of real-time data sharing, deeper collaboration and new research opportunities that can strengthen the model further. An example is the process related to modernisation of meat inspection—particularly with computer vision systems—which requires not just a national but also a cross-country collaboration to overcome legislative barriers at EU level (Sandberg et al., 2023).

The threats were mainly related to the close collaboration, which may be misunderstood as lack of impartiality, potentially undermining public trust. If relevant stakeholder groups are not involved in the negotiations, they may oppose decisions taken among other because they were not informed about the various concerns and limitations. An example of this could be the process related to the erection of the wild boar fence at the border between Denmark and Germany. The fence was perceived by the pig industry as an effective way of preventing the entry of ASF into Denmark, as pointed to by Dahl (2024). Still, a broader representation in the working group, beyond agricultural interests, could have been considered.

The analysis pointed to that a continued use of the model requires further focus on the applied governance model. All parties that are impacted by the activity under evaluation should be represented. Moreover – as pointed to by one of the respondents from the Danish Veterinary and Food Administration – it is necessary to defend the model publicly, as it has shown to be successful.

Regarding AMU, several initiatives have been taken by the pig sector, as described by Moura et al. (2023) e.g., banning use of antimicrobials as growth promoters and use of 3rd and 4th generation cephalosporins. More initiatives are in the pipeline focusing on infection prevention and control. Regarding piglet mortality, new methodologies applied in the DanBred breeding models have considerably improved piglet survival. Moreover, the applied breeding target prioritises robustness in sows and piglets way over litter size (Ostersen et al., 2025). Finally, an incentive system has recently been introduced whereby Danish pig producers can receive compensation for extra costs if pigs with whole tails are produced. It is expected that this will result in 4 million pigs with whole tails by 2028 (https://agricultureandfood.co.uk/news-and-statistics/news/compensation-will-mean-more-pigs-get-to-keep-a-curl-in-their-tail/).

Discussion

The Danish co-creation model is under scrutiny, where one criticism is that the livestock and meat industry has too much influence. However, a requirement for an increased arm's-length risks undermining the strengths of the model, because it would take away the co-creation. A well-operated collaboration model remains essential for resilient food systems, enabling feasible, sustainable solutions grounded in shared goals and mutual trust. Therefore, to maintain societal support, the governance structures applied in the model must be transparent, the stakeholder groups to participate must be considered more broadly than previously, and the roles of the representatives of each stakeholder group must be well-defined, and the communication channels robust.

The three areas mentioned above; AMU, piglet mortality, and tail docking represent issues, where co-creation through use of the model could help to find sustainable solutions. The Danish livestock and meat sector has an interest in initiating a process involving establishing working groups dealing with these issues. Active communication about this work, using storytelling as suggested by Ticó (2026) would be beneficial. Moreover, a result-oriented approach is needed to avoid that impatient politicians use legislation as an instrument to obtain here-and-now changes.

Regarding the mentioned challenges, the pig vet and similar professionals are key. Firstly, because they visit the pig producers, whereby they are transferring knowledge about what works and what doesn't and why. They are loyal to the pig producer, and together they find solutions to the challenges. As a trusted advisor, the pig vet has the responsibility to react not just to immediate problems but also to issues in the pipeline, including societal and legislative requirements. Hereby, the pig vet will be able to assist the pig producer in becoming ready for the future no matter what this entitles.

New tools based on artificial intelligence, in the form of so-called large language models (LLM) could likely be used to assess the impact of different proposals to the cross-sectoral working groups as suggested by Fetsch et al. (under revision). Recently, the Danish co-creation model was used successfully in societal negotiations on biodiversity, groundwater protection and greenhouse gas reduction, and major landscape reforms. The agreed aim is to take out 15% of all arable land out of production in Denmark. Had the agricultural industry not participated in this work, the negotiations would have happened anyway, now just without input from the people living from and on the land, securing livelihoods in the countryside.

Conclusion

The pig industry must engage more than ever before with society to identify feasible and sustainable solutions to the existing challenges. Collaboration and co-creation are the only way forward to find ways of handling the various issues that are being criticized, and hereby to maintain license to operate. Regarding AMU, piglet mortality and tail docking, the Danish pig industry already has targeted initiatives in the pipeline that are expected to make an impact. For several of these, the role of the pig vet and similar professionals will be pivotal to success.

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KEYNOTE SESSION

INNOVATION FOR BUILDING TRUST IN THE PIG SECTOR

GEMMA TICÒ

"Bridging the Gap: Reconnecting the Swine Industry with Society Through Storytelling"

Abstract

1. Introduction: from internal collaboration to external trust

Over recent decades, the European swine sector has changed substantially. Improvements in biosecurity, antimicrobial stewardship, disease monitoring, welfare assessment, and sustainability have strengthened production systems. These changes are measurable and increasingly standardized.

Within the sector, trust is mainly built through collaboration and evidence. Veterinarians, producers, researchers, regulators, and commercial partners work within governance frameworks supported by audits, performance indicators, and traceability.

However, this internal trust does not always translate into public trust. Despite clear progress, public debate about pig production often remains skeptical or morally ambivalent.

This paper addresses this interpretative gap by combining insights from social psychology, risk perception, and science communication.

Biosketch

CEO, Agencia Oinkers

Gemma Ticó is a veterinarian specialised in the swine sector, with a strong focus on communication and reputation management. She is the founder and CEO of Agencia Oinkers, the first communication agency dedicated exclusively to improving the public image of the swine industry. Her work supports professionals and companies in enhancing public trust through clear, strategic communication.

2. The gap: scientific progress vs. social representation

This divergence cannot be explained by information alone. It emerges from psychological, social, and contextual processes that influence how the swine sector is understood.

2.1 Public understanding as contextual performance
Evans and Miele (2019), in a multi-country qualitative study across Europe, demonstrated that public understanding of farm animal welfare is not a singular, stable attitude. Rather, it is performative and context-dependent. Individuals construct welfare knowledge through everyday practices such as shopping, cooking, and eating.

Importantly, participants often articulated contradictory positions within the same discussion. A consumer might simultaneously express concern for animal welfare, criticize industrial farming, and prioritize price or convenience in purchasing decisions.

These contradictions are not necessarily due to ignorance. They reflect the coexistence of moral, economic, and practical logic. Thus, the perception gap cannot be reduced to a simple information deficit. Public interpretation is situationally enacted rather than passively received.

2.2 The "meat paradox" and cognitive dissonance
Many studies have examined the tension between caring about animals and eating meat. Bastian and Loughnan (2016) referred to this tension as the "meat paradox." Most people say they oppose unnecessary animal suffering, yet most of them continue to consume meat.

This contradiction produces cognitive dissonance. According to dissonance theory, people feel psychological discomfort when their values do not match their behavior. To reduce this discomfort, they try to restore consistency.

Research shows that people usually change their beliefs rather than their behavior. Loughnan, Haslam, and Bastian (2010) experimentally demonstrated that meat consumption reduces the tendency to attribute mental capacities to animals. Participants who consumed meat attributed fewer mind-related characteristics and less moral status to animals than those who dit not consume meat.

These findings suggest that perception can shift to support existing behavior. Public resistance to sector messaging, therefore, should not be understood simply as a lack of information. It may reflect motivated reasoning aimed at protecting dietary identity.

2.3 Rationalization mechanisms: the 4Ns
Piazza et al. (2015) identified four dominant rationalizations used to justify meat consumption: Natural, Normal, Necessary, and Nice. These "4Ns" account for the majority of spontaneous justifications for eating meat across diverse populations.

Endorsement of the 4Ns correlates with:

- Reduced moral concern for animals.
- Lower guilt.
- Higher meat consumption frequency.
- Increased speciesist attitudes.

The 4Ns operate as identity-protective mechanisms. When meat consumption becomes morally challenged, these rationalizations stabilize self-concept. Therefore, communication strategies that frame consumption primarily as moral failure risk triggering defensive reinforcement rather than reflective engagement.

2.4 Selective exposure and polarization
Lueders et al. (2022) demonstrated that individuals selectively consume information aligning with their dietary identity. Participants favorable towards meat consumption preferred headlines rejecting meat reduction as an environmental strategy, while those critical of meat preferred confirmatory content. Selective exposure predicted increased polarization and social distance between groups. In contemporary digital ecosystems, algorithmic filtering further amplifies identity-consistent narratives. Thus, the communication challenge is not only about producing accurate information. It is about navigating information environments characterized by self-selection and polarization.

2.5 The attitude–behavior gap
In a large-scale Spanish survey, María (2006) found that many respondents reported strong concern for animal welfare and were willing to pay more for welfare-friendly products. However, their actual purchasing behavior did not consistently reflect these statements.

This gap shows that moral concern does not automatically lead to behavioral change. Buying decisions are influenced by several factors, such as price, habits, trust in welfare labels, and social signalling.

Therefore, public perception is multi-layered: it combines stated values, emotions, and real-world purchasing constraints.

3. Misunderstood Reality

The perception gap emerges from three structural drivers: motivated cognition; identity-based rationalization, and selective information exposure.

3.1 Motivated cognition
Cognitive dissonance reduction processes (Bastian & Loughnan, 2016) allow individuals to preserve dietary identity by adjusting beliefs about animals. Denial of animal mind reduces moral tension (Loughnan et al., 2010). Therefore, the challenge is not only to correct false claims, but also to understand that some beliefs serve psychological functions.

3.2 Identity protection
The 4Ns (Piazza et al., 2015) stabilize cultural norms surrounding meat consumption. When communication implicitly challenges these norms, defensive rationalization may intensify. Recognizing identity-protective reasoning does not imply endorsing it. It clarifies why purely confrontational approaches may fail.

3.3 Polarized information landscapes
Selective exposure (Lueders et al., 2022) means that audiences curate their information environment. Communication must therefore consider not only content but framing, accessibility, and credibility.

These mechanisms create interpretative filters through which sectoral innovation is evaluated.

The perception gap in the swine sector is not attributable to a single variable but emerges from interacting psychological and social mechanisms. These mechanisms operate simultaneously and reinforce one another, shaping how innovation is interpreted.

These interacting mechanisms indicate that perception is actively constructed rather than passively received. Strengthening institutional performance alone is therefore insufficient to recalibrate public interpretation. To understand how innovation becomes filtered through these mechanisms, it is necessary to distinguish between institutional and societal trust.

4. Trust has two dimensions

Institutional trust in the swine sector is grounded in: regulatory compliance, scientific validation, measurable performance, and surveillance systems. The sector has demonstrably invested in strengthening this dimension.

At the same time, societal trust depends on interpretability and relational credibility. Risk perception research shows that when individuals lack direct knowledge, they rely on social trust in managing authorities (Siegrist & Cvetkovich, 2000). Animal production is largely invisible to urban consumers; therefore, professional trust becomes central. If trust in institutions is low, technical data may be interpreted with suspicion.

5. From Innovation to guidance

To bridge the perception gap, innovation must be communicated as a structured process.

5.1 Dialogical construction of meaning
Häkli and Hakokõngäs (2024) argued that social knowledge about animal production is constructed dialogically. Ego–alter relations structure meaning through opposition. Production systems may be framed as industrial or necessary, efficient or harmful, depending on relational positioning. Communication therefore operates within contested interpretative fields.

5.2 Narrative cognition as translational tool
Dahlstrom (2014) demonstrated that narratives enhance comprehension, retention, and engagement. Narrative structure includes causality, temporality and agency. Scientific abstraction increases reliability but may reduce accessibility. Narrative translation reduces interpretative distance without compromising accuracy. Collaboration builds trust internally and narrative communication builds trust externally.

5.3 Examples

5.3.1 Antimicrobial stewardship
Institutionally, the sector can share the percentage reduction metrics. By contrast, narratively, it is important to talk about identification of antimicrobial resistance risk, veterinary-led protocol adjustment,

implementation challenges, monitoring cycles and measured outcomes. This structure embeds causality and temporality, enhancing intelligibility.

5.3.2 Welfare monitoring
Standardized welfare audits provide objective assessment. Narrative translation clarifies baseline welfare indicators, environmental modification, staff training and continuous evaluation. Agency is role-based rather than anecdotal, preserving professional tone.

5.3.3 Environmental sustainability
Environmental improvements can be contextualized within recognition of sustainability challenges, interdisciplinary collaboration, implementation phases and performance monitoring. Temporal structuring allows audiences to perceive transformation rather than static industrial imagery.

6. The pig veterinarian as a sector-consumer mediator

Within this framework, pig veterinarians hold a unique position. They combine scientific expertise with regulated professional accountability, and they operate within the daily reality of production.

Risk perception research shows that trust in those who manage a risk strongly shapes how people judge that risk (Siegrist & Cvetkovich, 2000). In this context, veterinarians can function as high-credibility messengers for public audiences.

Moreover, narrative formats can increase comprehension and engagement in non-expert audiences when technical content is translated into structured explanations (Dahlstrom, 2014). When veterinarians explain decisions and outcomes in clear narratives, scientific work becomes easier to follow.

In practical terms, pig veterinarians are not only clinical experts. They are also practical translators between the swine sector and the consumers, helping technical progress become understandable and trustworthy outside the farm. This makes veterinarians well placed to explain why decisions are made, not only what is done.

7. Structured and ethical storytelling as professional practice
Bridging the perception gap requires more than more data. It requires communication that is scientifically rigorous and delivered through responsible storytelling.

Scientific integrity is non-negotiable: transparency, methodological rigor, and representative evidence must remain central. Storytelling is a clear structure that makes technical work understandable: define the problem, explain the decision, describe implementation, and report measurable outcomes.

Communication should also reflect the dialogical nature of public debate by acknowledging different value frameworks, and it should make trusted professionals (especially veterinarians) visible as credible translators for consumers. Finally, it must be iterative, adapting to evolving discourse without weakening standards.

Because narratives can reduce counter-arguing and increase engagement (Dahlstrom, 2014), ethical safeguards are essential: avoid exaggeration, state uncertainty, preserve complexity, and use representative cases. Storytelling, in this framework, is not marketing; it is an ethical method of translating science for public understanding.

8. Conclusion

The swine sector operates within a complex psychological and social landscape characterized by motivated cognition, identity-protective rationalization, selective exposure, dialogical meaning construction, and trust-mediated risk perception.

Scientific innovation alone cannot recalibrate socially-constructed perceptions. Bridging the gap requires integrity in scientific practice, structured narrative translation, awareness of psychological dynamics and

visibility of trusted professional actors.

Communication is not public relations; it is perception, professional integrity and guidance within a narrative public sphere.

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KEYNOTE SESSION

FROM PEN TO PIXEL: PLF AND PIGS

GIUSEPPE BEE

"Driving the future of global livestock production: where are we heading?"

Abstract

Global livestock production faces intensifying challenges from climate change, environmental degradation, and evolving societal expectations. Pig production, as Europe's second largest livestock sector, exemplifies these tensions: pigs efficiently convert feed to protein, yet intensive systems generate significant environmental impacts and welfare concerns. This review examines the current state and future trajectories of European pig production through the lens of the Animal Task Force's (ATF) vision of "responsible livestock production". We analyse major drivers of change, evaluate environmental hotspots, and identify transformation pathways towards sustainability. Evidence shows that feed production and manure management account for 75–90% of pig production's environmental footprint, with 20–50% reductions achievable through available technologies. However, economic pressures, adoption barriers, and policy uncertainties constrain progress. Multiple transformation pathways exist—from precision-driven intensification to circular integrated systems—each with distinct trade-offs. The successful implementation of these pathways requires systemic innovation, coherent policy support, fair value distribution, and multi-stakeholder collaboration. The next decade will determine whether European pig production successfully transforms or faces managed decline.

Keywords: pig production, sustainability, animal welfare, precision livestock farming, circular agriculture, European agriculture

Biosketch

Head of the Swine Research Unit, Agroscope – Posieux – Switzerland

Dr. Giuseppe Bee is the Head of the Pig Research Group at Agroscope's Liebefeld-Posieux Research Station in Switzerland. With a Master's and Ph.D. in Animal Science from ETH Zurich, he has built extensive expertise in pig nutrition, physiology, and meat science. His research focuses on boar taint control, early-life programming effects on growth and meat quality, muscle fiber biology, and amino acid nutrition in swine. Dr. Bee has led and contributed to major international research initiatives, including MonoGutHealth, PigWeb, and Re-Livestock. He has supervised 15 Ph.D. students and held long-standing teaching roles at ETH Zurich in pig science and non-ruminant nutrition. He is actively involved in the scientific community, having served in editorial roles for Journal of Animal Science, animal, and currently as Editor-in-Chief of animal – open space. He is also Vice-President of the Animal Task Force and was a long-time member of the EAAP Pig Commission. Dr. Bee has authored over 100 peer-reviewed publications.

1. Introduction

Livestock production supplies approximately 35% of global protein while underpinning rural livelihoods across the world (Mateos et al., 2024). Generating roughly 23 million tonnes of pork annually, European pig production sits at the intersection of stringent environmental regulations, high welfare standards, and intense global competition (Mateos et al., 2024). The sector now faces a critical juncture where climate imperatives, nutrient pollution concerns, animal welfare debates, and economic pressures collectively demand transformative rather than incremental change.

The Animal Task Force's (ATF) vision of "responsible livestock production" provides a unifying framework built around five principles: environmental sustainability, economic viability, social acceptability, food security, and innovation-driven transformation. Within this context, pig production stands out as an ideal case study. Its notably high feed conversion efficiency (FCR, ~2.5–3:1) coexists with substantial environmental impacts, making the sector simultaneously part of the problem and a potential contributor to the solution in sustainable protein production (Rauw et al., 2020).

Against this backdrop, the present review addresses four interrelated themes: (1) current challenges facing European pig production, (2) environmental hotspots and mitigation strategies, (3) transformation pathways towards sustainability, and (4) policy and innovation requirements for a successful transition.

2. Current State and Major Challenges

2.1 Production Trends and Economic Pressures

Since its 2015 peak of over 24 million tonnes, European pig production has contracted to approximately 23 million tonnes, a decline shaped by annual farm exits of 3–5%, mounting disease pressure from African Swine Fever, and intensifying competition from lower-cost producers (Mateos et al., 2024). EU production costs of €1.40–1.60/kg carcass substantially exceed those of Brazil and the USA (€1.00–1.20/kg), compressing margins even where product standards are demonstrably higher (Pexas and Kyriazakis, 2023). This cost gap reflects a combination of higher welfare and environmental compliance costs, more expensive land and energy, and less favourable economies of scale relative to major competitors, structural factors that will not self-correct without targeted policy support and continued efficiency gains.

Meanwhile, farm consolidation continues unabated. The number of pig farms fell by 50% between 2005 and 2020, with surviving operations growing larger in scale. While this concentration heightens concerns over local environmental impacts, disease risk, and rural community vitality, it also creates conditions that are more conducive to technology adoption and efficiency gains (Dutt, 2025).

2.2 Environmental Hotspots

Life cycle assessments have consistently pointed to two dominant environmental hotspots that together account for 75–90% of pig production's total environmental burden (Pexas and Kyriazakis, 2023; Collins and Smith, 2022). The larger of the two is feed production, which is responsible for 60–80% of the total footprint: crop cultivation for animal feed drives greenhouse gas emissions through fertiliser manufacture and application, land-use change, and soil management, while soybean imports from deforestation-risk regions add further pressure on both the climate and biodiversity. The second hotspot is manure management, which contributes 15–30% of the footprint. Manure storage and field application release methane (CH4), nitrous oxide (N2O), and ammonia (NH3), with cascading consequences for climate change, air quality, and eutrophication. In regions of intensive production, nutrient surpluses routinely exceed what soils can assimilate, posing a persistent threat to water quality. Together, these two hotspots define the most productive territory for mitigation (Pexas and Kyriazakis, 2023).

2.3 Animal Welfare and Social Concerns

Intensive pig systems face growing welfare criticism on multiple fronts, including confinement practices such as gestation and farrowing crates, barren living environments, painful routine procedures such as castration and tail docking, and high stocking densities (Maes et al., 2020). EU regulations mandate certain improvements—the most notable of which is group housing for sows—yet implementation remains uneven across member states, even as public expectations continue to rise. Consumer surveys reflect a parallel erosion of trust in intensive livestock production, driven by concerns over animal treatment, antibiotic use, and environmental impacts (Kopler et al., 2023). The resulting "social licence" challenge increasingly threatens market access and premium pricing opportunities, particularly in Northern European markets, where welfare consciousness is most pronounced. This creates a structural tension at the heart of the sector's predicament: the welfare improvements needed to restore the social licence typically add costs

that further erode the very competitiveness the sector is struggling to defend.

3. Mitigation Strategies and Available Technologies

3.1 Feed and Nutrition Interventions

On the feed side, three complementary interventions offer meaningful and achievable gains. Precision nutrition, the tailoring of diets to specific production stages and individual animal requirements, can reduce crude protein levels by 2–3% without any loss of productive performance, translating into nitrogen excretion reductions of 15–25% (Mahfuz et al., 2022; Shurson and Urriola, 2022). Phase feeding, sex-specific diets, and amino acid balancing extend these gains further by aligning nutrient supply more closely with actual demand at each stage of growth. Alongside dietary precision, there is considerable scope for expanding the use of circular feed ingredients: food industry by-products, former foodstuffs, and food waste can all be incorporated into pig diets, which can simultaneously reduce the sector's land footprint and greenhouse gas emissions while diverting materials from waste streams. European pigs already consume approximately 10 million tonnes of such by-products annually, and the potential for further expansion remains substantial (Shurson, 2025; Shurson and Urriola, 2022). A third avenue lies in diversifying protein sources away from imported soy. Insect meal, single-cell proteins, and locally grown legumes, such as faba beans and peas, represent viable partial substitutes that can help ease deforestation pressure and cut the emissions associated with long-distance feed transport (Shurson, 2025).

3.2 Manure Management Technologies

Several technologies are available to address manure's contribution to the environmental footprint, and they work most effectively in combination. They differ considerably in cost and accessibility: slurry acidification and precision applications are relatively low-cost and deployable on most farm types, whereas anaerobic digestion requires substantial capital and is more viable at a larger scale or through collective investment. Anaerobic digestion transforms manure into biogas, capturing methane as a usable energy source while simultaneously producing digestate as a nutrient-rich fertiliser; where co-digestion with other organic waste streams is feasible, the economics improve further, and documented greenhouse gas emission reductions reach 40–60% (de Silva et al., 2022). Complementing this, slurry acidification offers a targeted route to cutting ammonia emissions by 60–70%, while solid-liquid separation enables a more precise, site-appropriate nutrient application and opens up additional downstream processing options (de Silva et al., 2022). Finally, the precision with which nutrients are returned to soils matters as much as the treatment technologies themselves. For example, GPS-guided injection paired with real-time soil sensing can substantially improve nutrient use efficiency, directly curtailing surplus applications and diffuse field losses that underpin much of the sector's broader environmental impact (Gómez et al., 2021).

3.3 Genetic Selection and Health Management

Selective breeding for feed efficiency, robustness, and disease resistance generates cumulative, compounding gains over time. Targeted selection for residual feed intake alone yields annual efficiency improvements of 1–2% (Zira et al., 2022). Alongside these genetic gains, enhanced herd health management reduces mortality, lowers medication use, and narrows the variability in productive performance.

3.4 Precision Livestock Farming

Sensor-based technologies now allow real-time monitoring of animal behaviour, health status, and housing conditions. Practical applications range from early disease detection and automated feeding to climate control optimisation and welfare assessment (Marić et al., 2025; Morrone et al., 2022). Despite this promise, the adoption of these strategies remains constrained [RT1.1]by high capital costs, system complexity, gaps in on-farm validation, and the technical skills required of producers.

4. Transformation Pathways

Based on the broader literature, four distinct [RT2.1]pathways towards responsible pig production emerge, each characterised by different strengths, limitations, and contextual requirements:

4.1 Sustainable Intensification

The sustainable intensification pathway centres on extracting maximum productive efficiency from existing systems through the combined application of precision technologies, genetic improvement, and optimised management while progressively reducing the environmental [RT3.1]burden per unit of output. Among the

four pathways, it offers the smallest land footprint and the highest feed efficiency, and the economies of scale inherent in larger operations make technology adoption more financially viable, with documented emission reductions of 20–40% achievable through available means. The trade-offs, however, are real: this pathway demands substantial capital investment and does not, of itself, resolve persistent welfare concerns. Local environmental impacts tend to be concentrated, dependency on external inputs remains high, and there is a limited inherent scope for market differentiation. Sustainable intensification is most naturally suited to competitive production regions where technology infrastructure and skilled labour are readily accessible (Marić et al., 2025; Collins and Smith, 2022).

4.2 Ecological/Organic Systems

At the opposite end of the spectrum, ecological and organic systems prioritise natural behaviours and minimal intervention, providing animals with outdoor access and organic feed within genuinely extensive production environments. This approach commands strong public support and opens access to premium market segments, outcomes that, combined with high welfare standards and demonstrable biodiversity benefits, also tend to translate into greater farmer satisfaction. The constraints, however, are considerable: land use runs two to three times that of conventional systems, per-kilogram emissions are typically higher, and the business case depends on sustained consumer willingness to pay price premiums. Scaling potential is inherently limited, and open outdoor systems carry elevated disease exposure risks. This pathway is therefore best suited to niche markets and regions where land is relatively available and welfare-conscious consumers are willing to pay accordingly (Maes et al., 2020).

4.3 Circular Integrated Systems

Circular integrated systems seek to close nutrient and material loops at the regional level by weaving together local feed sourcing, manure management, and crop production into a coherent, multi-functional whole. By systematically utilising agricultural by-products and actively managing regional nutrient balances, this approach can meaningfully reduce dependence on external inputs, foster effective nutrient cycling, and support rural economic vitality, with some additional scope for welfare improvements as part of broader farm diversification. The challenges lie primarily in execution: coordinating across multiple actors and land uses introduces organisational complexity, economic performance is variable, and several enabling technologies remain in development. Circular integrated systems therefore find their strongest expression in mixed farming landscapes and in areas already grappling with nutrient surplus concerns (Shurson, 2025; Shurson and Urriola, 2022). Illustrative examples can be readily found in the Netherlands and Flanders, where intensive pig production regions have piloted regional nutrient processing cooperatives that convert excess manure into exportable fertiliser products, demonstrating that circular integration is operationally feasible even in high-density production contexts.

4.4 Hybrid Context-Specific Approaches

The fourth pathway is less a fixed model than a design philosophy: rather than committing to a single approach, it draws selectively on elements from all three other pathways in response to the specific conditions, market opportunities, and farmer capacities at hand. This flexibility makes it well-suited to the heterogeneous realities of European agriculture and often represents the most realistic starting point for farms navigating uncertain transitions. The inherent strength—adaptability—is also a source of difficulty: hybrid approaches demand highly tailored solutions, can generate policy complexity, and risk producing unclear or inconsistent standards. Nevertheless, for contexts where neither full intensification, organic conversion, nor circular integration is individually appropriate, this approach offers the broadest scope for engaging diverse stakeholders across a wide range of constraints and opportunities (Rauw et al., 2020).

5. Policy and Innovation Requirements

5.1 Policy Coherence

The European Green Deal, Farm to Fork Strategy, and CAP reform together set ambitious sustainability targets, yet all three face substantial implementation challenges. Achieving real progress will require coherent alignment across environmental policy (nutrient limits, emission reduction), welfare regulation (housing standards, procedure bans), trade frameworks (border adjustments, standards equivalence), and support mechanisms (investment aid, advisory services) (Adams et al., 2025; Méité et al., 2024). Among the current misalignments, the most damaging is arguably the combination of rising domestic welfare and environmental standards with the absence of equivalent requirements on imported products. This simultaneously raises costs for European producers and risks shifting production and its impacts

to third countries, undermining both the sector's competitiveness and the environmental ambitions that the regulations are designed to serve. Long-term policy stability is a precondition for farmers' willingness to invest in transformation. Persistent regulatory uncertainty—particularly regarding future welfare requirements and tightening environmental limits—can breed risk aversion and delay the adoption of necessary improvements (Méité et al., 2024).

5.2 Innovation Priorities

Three innovation priorities stand out as particularly pressing. For precision livestock farming, the central challenge is no longer technical possibility but practical credibility. Precision livestock farming systems must be validated under real farm conditions, with transparent cost–benefit evidence and interfaces that working farmers can actually use. Public–private partnerships offer a well-tested mechanism for sharing the development burden and de-risking early adoption (Marić et al., 2025; Morrone et al., 2022). Equally important is continued investment in circular feed systems, specifically in the safety, nutritional characterisation, and supply chain logistics of by-product feeds and alternative proteins. Regulatory frameworks here will need to be carefully calibrated, enabling innovation without ignoring legitimate risk management concerns (Shurson, 2025). Cutting across both of these is the question of farmer engagement, which is too often treated as an afterthought. Participatory research, demonstration farms, peer-to-peer learning networks, and properly resourced advisory services should not be peripheral to innovation adoption, but they are foundational to it. The evidence is unambiguous that top-down mandates unaccompanied by meaningful support generate resistance rather than results (Froldi et al., 2023).

5.3 Value Chain Collaboration

Fair value distribution is foundational: farmers cannot sustain investment in improvement without adequate financial returns. Retailer sustainability initiatives, certification schemes, and public procurement policies all have an important role to play in creating a genuine market pull for higher standards. Furthermore, transparency and traceability technologies provide the evidential backbone for credible sustainability claims (Harrison et al., 2021).

6. Conclusions and Future Outlook

European pig production faces a decisive decade. From a technical standpoint, responsible production is within reach: the environmental hotspots are well-characterised, proven mitigation technologies are available, and impact reductions of 20–50% are demonstrably feasible. Whether that potential translates into practice, however, is far from certain. Several interconnected factors will prove critical to success.

First and most fundamentally, economic viability in European pig production must be secured through fair pricing structures and adequate public support for the transition investments that responsible production requires. This, in turn, depends on policy coherence: environmental, welfare, and trade policies must pull in the same direction, and they must do so with enough long-term regulatory stability to give farmers genuine confidence to invest. Alongside coherent policy, the adoption of innovation needs to be actively supported—not assumed. Technologies must be rigorously validated under real farm conditions, and their uptake requires sustained farmer engagement and accessible advisory services, not simply mandates from above. None of these will be achieved by any single actor alone; they altogether demand genuine multi-stakeholder collaboration, with responsibility shared equitably across research institutions, industry, government, and civil society. Finally, there is no single right model for sustainable pig production: pathway diversity is a strength, not a weakness, and context-sensitive solutions must be allowed to flourish rather than being crowded out by one-size-fits-all thinking.

Looking ahead, three broad scenarios can be envisioned. In the most optimistic, European pig production achieves genuine transformation, demonstrating through innovation, market differentiation, and coherent policy support that high standards and competitiveness are not merely compatible but mutually reinforcing. In a second and more troubling scenario, the sector enters a path of managed decline: as production costs continue to rise and import volumes grow, output gradually migrates to regions operating under lower environmental and welfare standards, leaving European consumers supplied by production chains that they neither see nor regulate. The third scenario, perhaps the most likely without concerted action, is one of muddling through fragmentary, incremental improvements that generate neither the sustainability gains nor the competitive strength needed for long-term viability, leaving the sector perpetually exposed.

The ATF's vision provides a coherent roadmap, but translating it into practice demands commitment, genuine

collaboration, and the willingness to make difficult choices. In high-consuming regions, dietary change, although politically sensitive, may prove a necessary complement to production-side improvements. Multiple transformation pathways exist—from precision-driven intensification to circular integrated systems—each with distinct trade-offs. The successful implementation of these pathways requires systemic innovation, coherent policy support, fair value distribution, and multi-stakeholder collaboration. That choice belongs to the stakeholders who must act collectively over the next five to ten years.

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KEYNOTE SESSION

FROM PEN TO PIXEL: PLF AND PIGS

LENNY VAN ERP-VAN DER KOOIJ

"AI and Sensors in Swine Farming: A Biological Approach"

Biosketch

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Elaine (Lenny) van Erp-van der Kooij has an MSc in Animal Science from Wageningen University and a PhD in Veterinary Science from Utrecht University in the Netherlands. Her PhD research was on coping behaviour in pigs. She is a professor in Animal Welfare and Technology at HAS green academy in the Netherlands and Visiting Professor of Practice in Precision Livestock Farming at Harper Adams University in the UK. Her main focus is improving the health and welfare of animals using sensor technology and data science. Projects and studies include AI and sensor applications in farm animals, horses and companion animals.

Abstract

1. Introduction

Traditional swine medicine has long relied on the "clinical eye" of the veterinarian and the stockmanship of the producer [1]. However, as farms intensify, subclinical illnesses—invisible to the human eye—create significant economic and welfare challenges that often only surface at the slaughterhouse [2]. PLF offers a paradigm shift by using sensors as the "eyes and ears" of the barn, 24 hours a day [1]. These technologies do not seek to replace human care but to augment it, providing early warnings that allow for preventive rather than reactive interventions [3].

For the modern swine practitioner, PLF represents a new diagnostic frontier. The practitioner's role is evolving from a traditional first responder to a "data steward" who navigates the connection between consumers, farmers, and the animals themselves ([1], [4]. Understanding the underlying biological logic of these sensors is essential for interpreting automated data streams into actionable health management plans [1].

2. Sensors and algorithms

PLF systems rely on a feedback loop: sensors capture raw physical data, which algorithms then process into biologically meaningful information [5].

2.1. Vision systems

2D and 3D (depth) cameras are widely used for non-invasive monitoring [2], [6]. 2D cameras are very useful for tracking lying patterns and group activity [5], [6]. 3D cameras, such as Time-of-Flight (ToF) sensors, allow for volumetric analysis, which is critical for accurate weight estimation and posture analysis without handling the animals [1], [2], [6]. AI-based vision systems can now perform feature extraction, identifying body parameters, pixel values, and motion patterns to detect aggression, feeding behaviour, or early disease signs [2], [6].

2.2. Acoustic monitoring

Microphones capture vocalizations that can be analyzed via neural networks [7], [8]. While early systems focused on stress calls or coughing, recent advancements allow for the classification of emotional valence (positive vs. negative states) by analyzing call duration and amplitude modulation [9]. Acoustic sensors are particularly valuable in detecting respiratory distress and the localization of sick animals within a large pen [7], [8].

2.3. Wearable sensors

Accelerometers, often embedded in ear tags or neck collars, provide continuous readings of physical activity [1], [10]. These are particularly effective for identifying sickness behaviour—subtle decreases in activity that accompany the innate immune response to infection [11], [12]. RFID systems at feeders and drinkers track individual resource usage, identifying off-feed events that are often the earliest indicators of disease [13].

3. Production stage monitoring

3.1. Breeding sows and farrowing

The periparturient period is a high-risk window for both the sow and her litter. Monitoring sow behaviour and posture changes can predict farrowing onset and identify complications. Farrowing can be predicted by accelerometers, detecting the increase in activity associated with nest-building behaviour, often 6 to 12 hours before the first piglet is born (Benjamin & Yik, 2019; Van Erp-van der Kooij & Rutter, 2020). Cameras can monitor parturition by detecting sow postures and newborn piglets [14]; sound cameras (acoustic arrays) can detect sow behaviours associated with farrowing and localize newborn piglets, providing real-time alerts for the start of farrowing [15]

3.2. Neonatal and weaned piglets

Piglet mortality remains a major economic hurdle, with a significant portion of pre-weaning deaths occurring in the first week due to low vitality, hypothermia, or crushing [16]. Computer vision can quantify the movement of individual piglets. Low vitality is a precursor to starvation and crushing; identifying these at-risk individuals allows for extra care such as supplemental feeding [16], [17]. Cameras can monitor thermal comfort. Infrared Thermography (IRT) allows for non-contact assessment of skin temperature. Vision systems can also detect “huddling” behaviour, an indicator of cold stress [5], [6], [7]. Smart crates and vibration-based technologies (e.g., SwineTech) monitor piglet distress screams and prevent crushing. If a crushing event is detected, the system provides a vibration stimulus to the sow, encouraging her to stand and release the piglet [18]. In weaned piglets, automated tracking of activity levels can detect lethargy associated with disease; for example, African Swine Fever (ASF) or other viral outbreaks can be detected before visible clinical signs appear [6].

3.3. Growing and finishing pigs

Efficiency and herd health are the primary drivers in the fattening stage [2], [5]. Computer vision systems now estimate live weight with high accuracy, replacing labour-intensive and stressful manual weighing [5], [6], [19]. Cough monitoring systems use acoustic sensors to identify respiratory outbreaks several days earlier than manual observation by the farmer. This allows for targeted medication, contributing to the responsible use of antibiotics [5], [8] Tail biting is preceded by changes in activity and tail posture. 3D sensors can detect a lowered tail posture as an early warning sign, allowing practitioners to address environmental stressors like ventilation failures before an outbreak occurs [5], [7], [19].

4. The role of the swine practitioner

A successful swine practitioner must solve problems and promote the financial prosperity of their clients [1]. PLF transforms raw data into predictive and prescriptive tools [4].

4.1. From snapshots to time-series analysis

Veterinarians traditionally rely on snapshots—a single visit or specific lab results [1]. PLF provides time-series data, showing how an animal deviates from its individual baseline. For example, a model analyses individual feeding patterns; a sudden drop in feeder registrations can trigger a health alert before a pig is visibly ill [13].

4.2. Benchmarking and stewardship

Practitioners can use PLF data to benchmark farms more accurately. Acoustic data on valence can provide a “Welfare Quality” score that connects consumer concerns with farm practices [1], [5], [6]. Furthermore, earlier disease detection ensures more responsible use of antimicrobials [8].

5. Implementation Challenges and Ethical Considerations

Wide implementation of PLF requires overcoming several hurdles. The first hurdle is the economic feasibility. The cost of sensor hardware and maintenance remains a concern for many producers [1], [3]. The second concern is data rights and privacy. Producers are often sceptical about data transparency and who owns the massive amount of information collected [1], [3], [4]. Robustness of the systems is a third issue. Barn environments are harsh (high humidity, ammonia, dust). Sensors must be durably designed to avoid frequent technical failures that damage farmer trust [1], [3], [11], [19]. Finally, the human factor is very important. There is a fear that automation will replace human care. This is a concern for consumers as well as for farmers. However, PLF should be viewed as a tool that brings the producer closer to the individual animal's needs, enhancing the human-animal bond [1], [7]. Interviewed farmers in the EU-PLF project stated that personal contact with the animals cannot be replaced by video cameras, but that PLF systems can be of great help in daily life [3]. Finally, practitioners should advocate for "multitool" solutions that solve several issues (e.g., health, growth, and climate) through a single interface rather than adding multiple dashboards that increase workload [3].

6. Conclusion

The integration of AI and sensors in swine farming represents a significant step toward a more sustainable and welfare-focused industry. For the swine practitioner, these technologies offer a chance to monitor herds continuously and objectively. By serving as a bridge between technical developers and producers, veterinarians ensure that automated data streams translate into improved animal health, environmental sustainability, and farm prosperity. As the sector continues to intensify, biological insights provided by PLF will become a necessity for modern herd management.

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KEYNOTE SESSION

INNOVATION IN INFECTIOUS DISEASE MANAGEMENT

SIMON GRAHAM

"Vaccine innovations:
From concept to impact"

Abstract

Infectious diseases of pigs cause major financial losses and threaten food security, animal welfare, and public health. Vaccination is a highly cost-effective tool to help prevent, control, and even eradicate diseases. Vaccines are traditionally inactivated and live attenuated pathogen products. For some diseases these vaccine modalities are highly effective, for others, they may provide clinical benefit by reducing disease severity, but fail to effectively control pathogens, and for some diseases, such vaccines are either ineffective or pose safety concerns. This has necessitated the research and development of alternative vaccine strategies. Swine medicine has frequently been at the forefront of developing and adopting novel vaccine concepts and technologies. Notable examples of this innovation include:

(i) The establishment of the differentiation of infected from vaccinated animals (DIVA) vaccine concept to enhance disease control:
For many pathogens, the primary goal of vaccination is to prevent or reduce disease. Vaccination may reduce clinical signs but may not completely protect the animal from infection and shedding of the pathogen. In disease outbreak/control situations, it is therefore important to be able to detect active infection in vaccinated animals in order to avoid spread of the disease. Varicellovirus suidalpha1, commonly known as pseudorabies virus (PrV), is the aetiological

Biosketch

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I am a veterinary immunologist with an interest in understanding mechanisms of protective immunity and its application to vaccine development. My early career focussed on parasitic diseases, I developed a natural cattle model for testing vaccines against onchocerciasis, which provided the first proof-of-principle for vaccine-induced protection. I also identified and evaluated vaccine candidate antigens from the parasite Theileria parva, which were designed to induce protective bovine CD8 T cell responses. My research then focussed on porcine viruses, such as classical swine fever (CSFV) and porcine reproductive and respiratory syndrome (PRRSV) viruses. I informed discussions on the use of emergency vaccination to control CSF outbreaks by demonstrating that live attenuated vaccines prevented transmission of divergent CSFV strains after only three days. My current research is largely focussed on PRRSV, and I am pursuing complimentary approaches to improved vaccine development. I am also working to develop a Nipah virus vaccine for pigs to reduce the risk this virus poses to public health, as well as the pig industries and livestock keepers, in South and Southeast Asia.

agent of Aujeszky's disease. Domestic pigs and wild suids are the main and only latent host of PrV but other mammals including cats, dogs, and ruminants are also susceptible to infection resulting in a disease that is almost always fatal. PrV has been eradicated from the domestic pig populations of Western Europe and North America following long-term control efforts combining movement control and vaccination. Adorján Bartha first attenuated PrV through serial passage in cell culture. The resultant PrV Bartha K61 strain proved to be a highly efficacious vaccine. Live attenuated PrV vaccines were developed in the 1980s that were genetically engineered to remove genes encoding virulence factors. Studies to assess the loss of such genes from PrV Bartha K61 revealed the absence of the gene encoding the immunogenic glycoprotein gE. Exploiting this observation, a serological ELISA test was developed to detect gE-specific antibodies in the serum of PrV infected pigs. Thus, the combination of PrV Bartha K61 and other genetically modified vaccines (commonly referred to as 'marker vaccines') with the companion gE ELISA, capable of discriminating infection in vaccinated animals (DIVA), provided the tools needed to aid the eradication of PrV. The success of this first DIVA strategy has led to its adoption to tackle other swine diseases. Topic reviewed in [1].

(ii) The development of a chimeric virus vaccine that enabled emergency vaccination strategies:
The classical swine fever virus (CSFV) is considered one of the greatest risks to the swine industry worldwide. Live attenuated CSFV vaccines (C-strain) were first developed in China by passage of virulent virus through rabbits and later by cell culture. These and other live attenuated CSFV vaccines are safe and highly efficacious and are widely used in endemic countries in Asia to help control the disease. In Europe, C-strain vaccines have been used successfully for oral bait vaccination of wild boar, which functioned as virus reservoirs, and a rapid onset of protection makes them an attractive tool to control CSF outbreaks in non-endemic regions. However, the lack of DIVA hampers the serological surveillance performed in pig-producing and -exporting countries and the use of live attenuated vaccines would prevent them from declaring or redeclaring freedom from CSF. Studies on immunity to CSFV revealed that the envelope glycoprotein E2 was the major target of the virus-neutralising antibody responses. Non-neutralising antibody responses were found to be induced against the Erns glycoprotein. Subunit vaccines comprising E2 were developed and sold in combination with DIVA companion diagnostic tests, which detected the presence of Erns specific antibodies. However, E2 subunit vaccines provided a slow onset of immunity and incomplete protection. So, these vaccines were considered only suitable for prophylactic use, ideally with multiple boosters, and not appropriate for emergency use. To address this, a recombinant viral vectored vaccine was developed. The vaccine used an attenuated strain of the related bovine viral diarrhoea virus (BVDV) to express the CSFV E2 gene. The vaccine induced antibodies that neutralised CSFV and antibodies which were BVDV Erns specific and were not detected by CSFV Erns based ELISAs, thus allowing DIVA. The vaccine was highly efficacious providing rapid and lasting protection and could be delivered orally to vaccinate wild boar. This vaccine was first live CSF DIVA vaccine licensed for use in Europe, enabling emergency vaccination that allows deviations from the trade restrictions of vaccinated animals. Topic reviewed in [2].

(iii) The licensing of the first RNA vaccine platform, which rapidly provides US producers with vaccines to combat emerging swine influenza virus strains:
RNA vaccines rose to prominence during the COVID-19 pandemic and are predicted to have saved millions of human lives. The simplicity and versatility of RNA vaccines has led to their evaluation to provide protection against a wide range of infectious diseases and even as personalised cancer vaccines. As with many vaccine innovations, RNA vaccines were first licensed for use in animal health. Influenza A viruses (IAV) remain a growing threat to global food security and public health. H5 and H9 avian IAV cause recurrent, economically devastating outbreaks in poultry, while the recent emergence of H5N1 IAV infections in cattle highlights their expanding host range. Endemic swine IAV plays a significant role in the porcine respiratory disease complex and further acts as reservoirs for zoonotic and potentially pandemic strains. Inactivated vaccines reduce clinical disease but fail to prevent virus transmission. Consequently, IAV continue to evolve and persist in vaccinated pig populations. To respond to this challenge, an RNA-based platform was developed to rapidly provide US pig producers with vaccines tailored to combat emerging IAV strains. Based on the IAV haemagglutinin (HA) sequence, a customised vaccine can be produced in 12–16 weeks, far faster than conventional vaccine approaches. The platform is akin to an autogenous vaccine approach but without the need to isolate and propagate the pathogen. Since antibodies specific to IAV neuraminidase often persist longer than HA antibodies and are less influenced by pre-existing immunity, a quadrivalent RNA vaccine delivering neuraminidase has been licensed in the US as a companion to the prescription HA vaccine to enhance the breadth of protection. Topic reviewed in [3].

(iv) The development of needle-free transdermal immunisation devices to improve animal welfare, dose efficiency, and traceability:

Whilst swine vaccines have traditionally been inoculated via intramuscular injection, there has been a move towards intra-/trans-dermal (ID) inoculation since this can provide advantages both in terms of practicality and welfare. Compared to needle inoculation, needle-free ID delivery reduces stress, risk of iatrogenic pathogen transmission, needle-induced injection-site lesions, and operator needle-stick injuries. Comparisons of the delivery of a modified live porcine reproductive and respiratory syndrome virus vaccine (PRRSV MLV) via ID and intramuscular routes have shown comparable immunogenicity (with some studies providing evidence of enhanced cell-mediated responses following ID delivery) and protective efficacy. Whilst still at an experimental stage, needle-free, 'solid dose' vaccines also hold promise and offer similar advantages as ID delivery, as well as the potential to reduce cold-chain storage requirements and extend vaccine shelf life. The technology uses a simple actuator device to deliver a precision engineered solid dose vaccine into the subcutaneous layer of the skin. As with ID delivery, a solid dose PRRSV MLV formulation has been shown to be as immunogenic/efficacious as a standard intramuscular injection with a liquid suspension of MLV. Topic reviewed in [4].

Despite these advances, significant disease challenges remain that require similarly innovative approaches, backed by cutting-edge science. For example, new and/or improved vaccines are required to aid the control of the PRRS and African swine fever (ASF) panzootics:

PRRS is characterised by reproductive failure in sows and respiratory complications and weakened immune responses in pigs of all ages. PRRS remains arguably the most important infectious disease affecting the global pig industry; with annual losses in the USA and Europe alone estimated to exceed $600 million and €1.5 billion, respectively. The causative PRRSV are rapidly evolving and are poorly controlled by current MLV and inactivated virus vaccines. There is therefore an urgent requirement to explore alternative approaches to PRRS vaccine development. These efforts are hampered by our incomplete understanding of immunity to PRRSV. Evasion of neutralising antibodies (nAb) responses is likely a mechanism that PRRSV has evolved to enable it persistence, and passive transfer experiments has provided evidence for nAbs providing protection. Animals may clear infection and be protected against re-infection in the absence of nAb. T cell responses increase concomitant with viral clearance, and these cells may play a critical role in the absence of nAb. The early experimental approaches to develop improved PRRSV vaccines struggled to match or exceed the efficacy provided by MLV. Thus, effort has been invested in genetically engineering MLV to improve the magnitude and breadth of immune responses and hence cross-protection. Initial efforts to develop a subunit vaccine focussed on delivery of PRRSV envelope glycoprotein 5 as a putative nAb target. More recent studies have evaluated combinations of PRRSV antigens often delivered via viral or RNA vectors, with the aim of improving nAb and T cell responses, which has produced at least partial protection. Broadly nAbs are the subject of intense research in the context of other highly variable viruses. Central to these efforts are methods to define conserved neutralising epitopes, which can inform the design of novel immunogens. This 'structural vaccinology' approach has provided important advances in the quest to develop vaccines to hypervariable human viruses (e.g., respiratory syncytial virus, HIV, and IAV). Information on PRRSV broadly nAbs and their cognate epitopes is scarce. However, recent studies have shown that broadly nAbs can be found in routinely vaccinated sows and be induced in experimentally infected piglets. Whilst technically ambitious, structural vaccinology represents an attractive approach to explore in the development of a much-needed broadly protective PRRSV vaccine. Topic reviewed in [5].

ASF is a devastating disease that results in high mortality in domestic pigs. Following the incursion of the causative ASF virus (ASFV) into Georgia in 2007, the virus spread across the region, extending to East and Southeast Asia, Oceana, Europe, and the Caribbean. Efforts to develop a safe and effective ASFV vaccine, which had been ongoing for decades, were accelerated in response to the emerging panzootic. Most focussed on using genetic engineering to rationally attenuate ASFV. However, ASFV is a large, complex virus whose genome encodes nearly 200 proteins, many involved in immune evasion and virulence. Experimental studies with MLV vaccines have shown promise in terms of their efficacy. Consequently, MLVs have been licensed and made commercially available in Vietnam and neighbouring countries. However, concerns remain over the safety of MLV and the potential for reversion to virulence and recombination with field strains. A concern heightened by the emergence and spread of highly virulent ASFV strains, which appear to derive from recombination between attenuated genotype I and virulent panzootic genotype II ASFV strains, and that are resistant to the immunity provided by genotype II based MLV. Elegant fundamental research studies are ongoing to better understand ASFV, which may provide opportunities to fine tune attenuation and improve safety whilst still enabling the induction of protective

immunity. Developing a subunit vaccine is an attractive alternative strategy but also challenging due to an incomplete understanding of protective immunity, the complexity of ASFV infection biology, and the large number of potential vaccine candidate antigens. Studies have focussed both on inducing antibody responses to structural proteins and T cell responses to these and additional ASFV antigens. Whilst a cocktail of ASFV antigens delivered using viral vectors protected pigs against virulent genotype I ASFV, this could not be translated with the same success to genotype II ASFV. So whilst there are promising data, more work is required to refine this approach to provide the efficacy needed for deployment in the field. Topic reviewed in [6].

Vaccinology had advanced considerably from the 'isolate, inactivate, and inject' principle that underpinned vaccine development for decades. An improved understanding of pathogen biology and antigenicity, recombinant DNA technology and synthetic biology, and the porcine immune system have enabled innovative approaches that have led to incremental and step changes, which have aided the control of diseases and improved the health and welfare of pigs. But, as illustrated with the examples of PRRSV and ASFV, major and persistent challenges remain that require a deeper understanding and continued research and innovation to find vaccine solutions that are both safe and effective.

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KEYNOTE SESSION

INNOVATION IN INFECTIOUS DISEASE MANAGEMENT

MERETE FREDHOLM

"From genes to practice:
Breeding for animal health and resilience"

Biosketch

Introduction

Breeding companies are placing increasing emphasis on robustness as a central component of their selection objectives, reflecting the growing need for animals capable of sustaining high performance under diverse environmental and management conditions. Genetic strategies to enhance robustness - including improved survival, immune function, and resilience to stress -are increasingly viewed as essential for sustainable pig production (reviewed by Gombos et al., 2025). However, although improved overall health and reduced susceptibility to infectious diseases are central goals of such efforts, effective tools to directly select for these traits remain limited, illustrating the challenges associated with measuring and genetically improving health traits.

Post-weaning diarrhea (PWD) remains one of the most significant health challenges in pig production. Occurring during the stressful transition from sow milk to solid feed, PWD leads to impaired growth, increased morbidity, reduced animal welfare, and substantial economic losses (e.g. Iribagiza et al., 2025). Moreover, because PWD is a major driver of antimicrobial use, it directly contributes to the development of antimicrobial resistance, reinforcing the urgency of implementing effective preventive strategies (Guitart-Matas et al., 2024).

Biosketch

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She is a veterinary doctor graduated from The Royal Veterinary and Agricultural University, Copenhagen, Denmark (now part of the University of Copenhagen). She also earned both her PhD and Dr. Vet. Sci. degrees from the same institution. Currently, she is professor of Animal Genetics at the Department of Veterinary and Animal Sciences.
Her research centers on molecular genomics and clinical genetics. Together with her research group, she has identified causative mutations for various diseases as well as candidate genes associated with disease- and production traits across multiple animal species. She has made significant contributions to the advancement of molecular tools for genome analysis in livestock species. Her work includes active participation in several international research consortia, most notably the International Swine Genome Consortium and the Farm Animal Genotype-Tissue Expression (FarmGTEx) Consortium.

A key step toward achieving sustainable control of PWD is to understand why some piglets can cope effectively with the physiological and environmental challenges of weaning, whereas others become affected by disease. This variation in outcomes reflects underlying differences in the animals' robustness or resilience, i.e., their inherent capacity to maintain performance and health when exposed to stressors. Robustness and resilience are increasingly recognized as genetically variable traits that can be defined, quantified, and ultimately targeted through selection once appropriate phenotypic or molecular indicators are identified (Rufino Salinas & Pegolo, 2023). Identifying molecular markers associated with robustness is therefore crucial not only early in life, when predictive biomarkers could support targeted, antibiotic free interventions, but also later in life, where genetically informative markers can guide breeding decisions and provide a basis for long term assessments of resilience. Omics driven studies increasingly demonstrate the potential of biomarker-based approaches for selecting pigs with improved disease resilience, including enhanced responses to post weaning challenges (Chen, 2021).

Molecular signatures associated with PWD susceptibility offer a promising basis for improving both management and selection strategies. Their integration into production systems could shift PWD control toward a more proactive, resilience focused framework that aligns animal health, welfare, and reduced antimicrobial use.

Phenotypic characterization as a foundation for molecular studies of PWD

To establish a foundation for identifying molecular signatures associated with PWD, a cohort of 2,550 three-way crossbred pigs ((LY) × D) from 170 litters in a Danish production herd was monitored from birth to 10 weeks of age. In each litter, 15 newborn piglets remained with their biological dam until weaning. All piglets were observed daily, with special focus on diarrhea symptoms and with observations recorded electronically. They were weighed at birth, on day 4, and subsequently at weekly intervals. At each weighing, fecal swabs were collected. In addition, on day 25 (the day before weaning) and day 46, blood samples and fecal samples were collected for further analysis. No batch-level treatments were administered during the study period and pigs with diarrhea were only treated if they were also clinically affected (loss of body weight, rough hair coat, unthriftiness).

As reported by Morsing and colleagues (2025), complete longitudinal records from birth to 10 weeks of age were available for 1,861 of the 2550 pigs included in the study. Across this cohort, diarrhea events were common. Overall, 73% of pigs experienced at least one episode of self-resolving diarrhea that did not require antimicrobial treatment, whereas 25% developed diarrhea accompanied by clinical signs and subsequently received antimicrobial treatment. Only 2% of pigs remained free of diarrhea throughout the entire study period. Before weaning, 37% of the pigs exhibited one or more episodes of self-resolving diarrhea. A smaller proportion (7%) required antimicrobial treatment for clinically apparent diarrhea. The remaining 56% showed no evidence of diarrhea and received no treatment during this period. Following weaning, the incidence of diarrhea increased markedly. A total of 76% of the pigs experienced self-resolving diarrhea, while 21% required antimicrobial treatment for clinically significant episodes. Only 3% of the pigs completed the post-weaning period without any treatment.

Early-life factors predicting robustness in piglets

Across two complementary studies, we identified biological factors present before weaning that help predict which piglets will remain robust versus those that will require treatment during the first two weeks post-weaning. Together, these findings outline a set of early-life physiological and molecular indicators linked to resilience during the weaning transition.

In the first study (Sun et al., manuscript in preparation), we investigated how pre-weaning growth performance, hematological traits, immune status, genotypes, and post-weaning diarrhea (PWD) treatment outcomes are interconnected. The analyses revealed that specific hematological traits mediate the relationship between relative weaning weight and later PWD susceptibility, particularly in slower-growing pigs. These traits, combined with growth performance, captured important aspects of immune function and overall physiological status relevant for post-weaning robustness. Genetic analyses further showed that SNPs associated with early-life growth and hematological traits carry information relevant to PWD risk, supporting the notion that early-life robustness has a measurable genetic component. Collectively, this study provides a framework linking growth, immunity, and genetic background to disease vulnerability.

The second study (Luigi et al., manuscript in preparation) used RNA-seq analysis of blood collected one day before weaning to characterize transcriptional signatures associated with later health status. Piglets that remained healthy showed upregulation of genes involved in amino acid homeostasis, nutrient sensing, metabolic flexibility, and immune regulation indicating a balanced, adaptive physiological state well-suited for the dietary and environmental challenges of weaning. These animals also displayed markers of controlled immune surveillance and restrained inflammation. In contrast, piglets that later required PWD treatment exhibited transcriptional signatures dominated by heightened cytotoxic and natural killer cell activity, pointing to pre-existing immune activation and inflammatory stress.

Taken together, the two studies highlight a coherent set of early-life indicators of robustness: efficient metabolic and immune regulation, favorable hematological profiles, adaptive growth patterns, and supportive genetic architecture. Conversely, signs of heightened cytotoxic activity, inflammatory pressure, or suboptimal hematological status before weaning signal increased risk of post-weaning treatment. These insights provide a foundation for developing integrated phenotypic, hematological, and genomic markers to identify robust piglets early in life.

Evaluation of robustness as a quantitative genetic trait

Distinctive, well-defined phenotypes are essential for downstream genomic analyses, as precise trait characterization increases the power to detect loci associated with complex biological responses. To address this requirement, we analyzed clinical data collected during the first two weeks after weaning to develop and validate a quantitative scoring system for PWD that not only quantifies disease severity but also integrates phenotypic dimensions related to robustness and resilience (Jiahong et al., unpublished). The dataset included detailed clinical scores describing both the duration and severity of diarrhea. Duration was quantified using fecal staining, the most reliable indicator, with consecutive days (including short gaps) merged into single events. Severity was evaluated using rolling 3- or 7-day windows to capture symptoms emerging after the onset of diarrhea. A regression model with treatment as the marker of severe disease provided symptom-specific weights, with unthriftiness and poor body condition contributing most strongly. These weights were integrated into a severity score for each event. Diarrhea burden was then calculated as Burden = Duration × (1 + Severity), and summing the burdens across all events yielded a diarrhea index for each pig.

Including the diarrhea index as a phenotype in the GWAS led us to a genomic region containing several mutations in the 3' untranslated region of a gene known to inhibit autophagy. Given the central role of autophagy in shaping the gut microbiota and maintaining the integrity of the intestinal barrier, this association suggests that altered regulation of autophagy may contribute to dysbiosis and, consequently, to a heightened susceptibility to severe or prolonged diarrhea.

Similarly, when diarrhea duration was included as a phenotype, the GWAS revealed a significant association within a region harboring genes involved in suppressing the Hedgehog signaling pathway - a pathway critical for intestinal development and for ensuring epithelial stability. This finding points to the possibility that genetic variation affecting epithelial maintenance may influence the persistence of diarrheal episodes.

Conclusion

By combining longitudinal phenotyping, early life biomarker identification, and genomic analyses we have established an integrated framework for characterizing susceptibility to post weaning diarrhea (PWD).

Early-life analyses showed that physiological and molecular status before weaning - reflected in hematological traits, growth patterns, and blood transcriptomes - strongly predicts later robustness. Piglets that remained healthy displayed balanced immune activity and adaptive metabolic regulation, whereas those later requiring treatment exhibited signs of inflammatory activation already before weaning.

Using detailed clinical observations from the post weaning period, we have demonstrated that it is possible to develop a quantitative scoring system that captures both the duration and severity of diarrhea. This standardized diarrhea index enabled genome wide association analyses that identified biologically meaningful genomic regions related to autophagy regulation, gut barrier integrity, epithelial development, and tissue homeostasis. These pathways appear to underlie variation in both severity and persistence of PWD.

Overall, the integration of phenotypic, molecular, and genomic information establishes a robust framework for developing predictive markers and breeding strategies aimed at enhancing resilience and reducing reliance on antimicrobials in pig production. Building on this foundation, future work will focus on expanding the analysis of both the clinical datasets and the associated omics layers to further refine these insights and improve their applicability.

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KEYNOTE SESSION
INNOVATION FOR A CIRCULAR MODEL

VALENTÌN MOLINA-MORENO

"Implementing Circular Economy to Improve Swine Sector Health: A Comprehensive Framework"

Abstract

1. Introduction

In recent decades, pork production has been increasing and has emerged as the most consumed meat worldwide (Cândido et al., 2022). As a consequence, pig farming industry generates large quantities of swine wastewater containing urine and excreta, washing water, food, organic matter, and nutrients (Kunz et al., 2009). The treatment of swine wastewater is fundamental to avoid environmental pollution and public health problems, and to promote the recovery of water, nutrients, energy and other compounds of commercial interest in the paradigm of circular economy. Among the different alternatives, it should be highlighted the anaerobic digestion for producing biogas and digestate rich in nutrients, microalgae-based processes for removing nutrients and producing valuable biomass, and chemical crystallization for recovering phosphorus (Dinnebier et al., 2021; Cândido et al., 2022; Pinatha et al., 2025).

In the circular economy framework, waste is converted into resources, also known as technological nutrients, which can be reintegrated into the production cycle (Molina-Moreno et al., 2016). In the case of swine wastewater, it is possible to integrate the circular economy model into different wastewater treatment systems capable of reusing water and recovering nutrients

Biosketch

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Valentín Molina Moreno is a Full Professor of Business Organization at the University of Granada, specializing in circular economy, and sustainability in business management. He combines teaching, research, and knowledge transfer with national and international collaboration.At the international level, he has taught at universities in various countries across the European Union, the Balkans, the Caucasus, and Latin America, mainly within official Master's and PhD programs related to his research fields. His main research areas are the circular economy, corporate social responsibility, and sustainability with significant scientific contributions in the latter, particularly in designing indicators for measuring and evaluating circularity in sectors such as construction, water, and logistics distribution. Quantitatively, his academic output includes more than 100 contributions to national and international conferences and over 50 research articles in indexed scientific journals. His research metrics include 2.951 citations, an H-index of 28, and an i10-index of 52 on Google Scholar. He has received two international research awards related to circular economy and sustainability and has been granted three six-year research periods two for research activity and one for research transfer. He is also recognized with five research periods awarded by the Regional Government of Andalusia.

He has also supervised four doctoral theses since 2005, participated as a member of 22 doctoral thesis evaluation committees, and supervised 75 Master's theses, three of them international. Additionally, he has completed 28 teaching and research stays at various universities in Latin America and Europe, funded through competitive calls. He has also participated, and continues to participate, in several national and international R&D projects.

and energy. In this work, in order to evaluate the degree of approach of pig farming industry to this model, circularity indicators are implemented to quantify the reusability potential of the different resources contained in swine wastewater into the production systems and to optimize the decision-making process in this sector.

2. Materials and methods

A review of the academic literature published in Scopus was conducted in March 2026, using the following search string: (TITLE-ABS-KEY ("swine wastewater*") AND TITLE-ABS-KEY ("circular economy")). A total of 20 documents were identified, all of which were published from 2020 onwards. Of these, 13 are research articles, 4 are reviews, and 3 are book chapters.

The following circularity indicators were established to evaluate the degree of alignment of the swine industry with the circular economy model in relation to water reuse, and the recovery of nutrients, energy and other resources.

2.1. Circularity indicators for water reuse

Two indicators are proposed. The first, $CI_{WR,TN}$, is based on the consideration of swine wastewater as a technological nutrient and evaluates the treated water recovered from wastewater that could be reused in the production process, provided it complies with the relevant regulations, as shown in Eq. (1). The second indicator, CIWR,CE, is based on the circular economy model and determines the reduction of water consumption within the production process according to Eq. (2):

$$CI_{WR,TN} = \frac{Q_E}{Q_{SW}} \quad (1) \qquad CI_{WR,CE} = \frac{Q_E}{Q_I} \cdot 100 \quad (2)$$

where Q_E, Q_{SW} and Q_I are the volumetric flow rates of treated water, swine wastewater, and water consumed in the production process, respectively.

2.2. Circularity indicators for nutrient recovery

In this case, two indicators are also proposed regarding the characterization of swine wastewater as a technological nutrient. These indicators determine the production of sludge ($CI_{NR,TN,SG}$) and nitrogen, phosphorus, potassium, microalgae, or struvite ($CI_{NR,TN,i}$) derived from swine wastewater treatment, which are potentially reusable in the production process, according to Eq. (3) and Eq. (4), respectively:

$$CI_{NR,TN,SG} = \frac{Q_{SG}}{Q_{SW}} \quad (3) \qquad CI_{NR,TN,i} = \frac{F_i}{Q_{SW}} \quad (4)$$

where Q_{SG} is the volumetric flow rate of sludge generated in the process, and F_i is the mass flow rate of i, representing nitrogen (N), phosphorus (P), potassium (K), microalgae (M), or struvite (S).

2.3. Circularity indicators for energy recovery

Regarding energy recovery, three indicators are established: the first two relate to the nature of swine wastewater as a technological nutrient, while the third concerns the reduction in electrical energy consumption within the circular economy framework. The first indicator, $CI_{ER,TN,B}$, evaluates the biogas obtained from swine wastewater treatment according to Eq. (5); the second, $CI_{ER,TN,EE}$, determines the electrical energy generated from swine wastewater treatment as per Eq. (6); and the third, $CI_{ER,CE}$, is evaluated as the ratio between the electrical energy generated and that consumed in the process, as shown in Eq. (7):

$$CI_{ER,TN,B} = \frac{Q_B}{Q_{SW}} \quad (5) \qquad CI_{ER,TN,EE} = \frac{E_G}{Q_{SW}} \quad (6) \qquad CI_{ER,CE} = \frac{E_G}{E_C} \cdot 100 \quad (7)$$

where Q_B is the volumetric flow rate of biogas generated during the swine wastewater treatment, E_G is the electrical energy generated, and E_C is the electrical energy consumed in the process.

2.4. Circularity indicators for other resources recovery

In this case, the following circularity indicator is proposed, which also refers to the nature of swine wastewater as a technological nutrient and determines the production of carbohydrates, proteins, or lipids from swine wastewater ($CI_{OR,TN,j}$) according to Eq. (8):

$$CI_{OR,TN,j} = \frac{F_j}{Q_{SW}} \quad (8)$$

where F_j is the mass flow rate of j, representing carbohydrates (CH), proteins (PT), or lipids (L).

3. Results and discussion

The limited number of research papers, combined with the recent timeframe of their publication, clearly demonstrates that this is an emerging line of research. Furthermore, the journals publishing the majority of the works in this research line are of remarkably high impact (e.g., Science of the Total Environment, Journal of Environmental Management, or Bioresource Technology, which have published 8 articles, accounting for 40% of the academic output). This further underscores the particular relevance of this research line, not only for the academic community but also for society at large, given the critical challenges it addresses.

To take this analysis a step further, a clustering and evaluation of the keywords contained in the documents was performed using the co-occurrence method. This approach is based on the principle that documents meeting the search criteria share common keywords (Kessler, 1963), thereby allowing for the identification of a conceptual and thematic structure to provide an overview of the research topics addressed. VOSviewer (Van Eck and Waltman, 2010) was utilized for this purpose, identifying a total of 74 keywords, of which only 18 were correlated. Figure 1 illustrates these results.

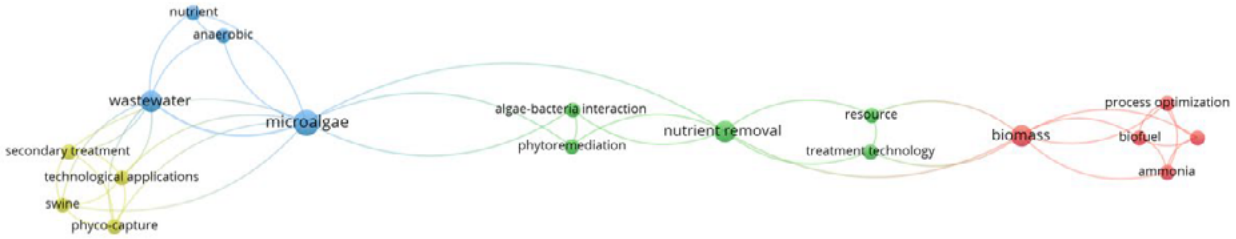

Figure 1. Co-occurrence network of keywords. Source: Own elaboration based on VOSviewer.

The colors represent the research themes, while the size of the circles indicates the frequency with which the keywords appear; similarly, the lines illustrate the frequency of their co-occurrence. Four distinct research themes were identified: swine wastewater treatment via microalgae systems, frequently coupled with anaerobic digestion (blue); nutrient removal, which is closely linked to microalgae systems due to the biological basis of the treatment process (green); biomass utilization, directly related to the previous two thematic areas as it derives from microalgae-based treatment (red); and finally, other secondary treatments and applications (yellow). The positioning on the map is also significant: central keywords identify the most frequently analyzed research topics, whereas those located at the periphery represent keywords used less frequently in relative terms.

Based on the importance of the different research themes, it was decided to analyze three representative research articles covering the most relevant treatment options according to the results shown in Figure 1. In the first article, wastewater was treated via anaerobic digestion, followed by digestate treatment for nitrogen removal through nitrification-denitrification and phosphorus recovery by chemical precipitation. The subsequent study coupled anaerobic digestion with a downstream microalgae-based treatment process, while the final article combined anaerobic digestion with chemical crystallization.

Table 1 presents the circularity indicators defined in Section 2, which have been implemented for the three aforementioned research articles. The various treatments of swine wastewater enable potential water reuse, as well as the recovery of nutrients, energy, and other compounds of high added value contained within the swine wastewater, transforming it into a technological nutrient. Specifically, per cubic meter of swine wastewater, the following are obtained: 0.65 m3 of water; 0.21 m3 of sludge —containing 0.05 kg of nitrogen, 0.18 kg of phosphorus, and 0.06 kg of potassium—, 4.49 kg of microalgae; 0.78 kg of struvite (including 0.09 kg of phosphorus), 4.22-6.89 m3 of biogas, 9.79-13.82 kWh of electrical energy, and 1.05 kg of carbohydrates, 2.67 kg of proteins, and 0.14 kg of lipids (Table 1). These results highlight the importance of treating this waste within the circular economy framework to recover the resources contained therein.

The treated effluent can be reused within the production process for cleaning swine housing facilities and as irrigation water, provided that a prior study on quality and sanitary requirements is conducted. In this regard, the reclaimed water enables a 48.59% reduction in water consumption within the production process, which entails a significant benefit given the current global water scarcity (Table 1).

The simultaneous recovery of nutrients and energy from swine wastewater reduces its environmental impact on natural water bodies, soil, and the atmosphere, while also mitigating hygienic-sanitary problems. Moreover, this recovery enables the formation of microalgal biomass rich in proteins, carbohydrates, and lipids, which can be valorized for the production of biofuels, biofertilizers, or animal feed supplements, or the formation of struvite that serves as an alternative fertilizer or soil conditioner, thereby helping to mitigate the global decline in phosphorus reserves (Silveira et al., 2021; Pinatha et al., 2025). From an energy perspective, there are also significant reductions in electrical energy consumption; in this case, the value for the circularity indicator CIER,CE of 355.30% demonstrates the energy self-sufficiency of the process and the generation of an energy surplus (Table 1).

Table 1. Implementation of circularity indicators in the pig farming industry within the circular economy paradigm.

Swine wastewater treatment	Water reuse	Nutrient recovery	Energy recovery	Recovery of other resources	Reference
Influent: 192 m^3 day^{-1}. Process: 1) Pretreatment. 2) Anaerobic digestion. 3) Digestate treatment: nitrogen removal and phosphorus recovery.	Final effluent: 124.5 m^3 day^{-1}. Nitrogen removal: 98.6%. Phosphorus removal: 89.7%. *Salmonella*, *E. coli* and PCV2 were not observed in the final effluent. Farm water consumption: 256.2 m^3 day^{-1}.	Sludge generation: 40.0 m^3 day^{-1}. Fertilizer production: 10.10 kg day^{-1} of total nitrogen, 33.79 kg day^{-1} of total phosphorus and 11.81 kg day^{-1} of potassium.	Biogas production: 810.8 m^3 day^{-1}. Electrical energy generation: 1880.6 kWh day^{-1}. Electrical energy consumption: 529.3 kWh day^{-1}.		Cândido et al. (2022)
		Circularity Indicators			
	$CI_{WR,TN}$=0.65 m^3water m^{-3}sww $CI_{WR,CE}$=48.59%	$CI_{NR,TN,SG}$=0.21 m^3sludge m^{-3}sww $CI_{NR,TN,N}$=0.05 kg nitrogen m^{-3}sww $CI_{NR,TN,P}$=0.18 kg phosphorus m^{-3}sww $CI_{NR,TN,K}$=0.06 kg potassium m^{-3}sww	$CI_{ER,TN,B}$=4.22 m^3biogas m^{-3}sww $CI_{ER,TN,EE}$=9.79 kWh m^{-3}sww $CI_{ER,CE}$=355.30%		
Influent: 22.8 m^3 day^{-1}. Process: 1) Pretreatment. 2) Anaerobic digestion. 3) Phycoremediation. 4) Co-digestion.	Nitrogen removal: 70-78 %. Phosphate removal: 15.0-98.0 %.	Microalgae production: 102.3 kg day^{-1}. Biomass productivity: 14.8-198.0 mg L^{-1} day^{-1}. N assimilation rate: 8.88-118.80 mg L^{-1} day^{-1}. P assimilation rate: 19.60-263.30 mg L^{-1} day^{-1}.	Biogas production: 157 m^3 day^{-1}. Electrical energy generation: 315 kWh day^{-1}.	Characterization of *Chlorella sorokiniana* LBA#39: Carbohydrates: 23.4%. Proteins: 59.5%. Lipids: 3.1%.	Dinnebier et al. (2021)
		Circularity Indicators			
		$CI_{NR,TN,M}$=4.49 kg microalgae m^{-3}sww	$CI_{ER,TN,B}$=6.89 m^3biogas m^{-3}sww $CI_{ER,TN,EE}$=13.82 kWh m^{-3}sww	$CI_{OR,TN,CH}$=1.05 kg carbohydrate m^{-3}sww $CI_{OR,TN,PT}$=2.67 kg protein m^{-3}sww $CI_{OR,TN,L}$=0.14 kg lipid m^{-3}sww	
Influent: 14.06 m^3 day^{-1}. Process: 1) Anaerobic digestion. 2) Chemical crystallization.	Phosphorus recovery efficiency: 39.23-91.18%.	Struvite production: 10.95 kg day^{-1} (1.28 kgP day^{-1}).			Pinatha et al. (2025)
		Circularity Indicators			
		$CI_{NR,TN,S}$=0.78 kg struvite m^{-3}sww $CI_{NR,TN,P}$=0.09 kg phosphorus m^{-3}sww			

4. Conclusions

The treatment of swine wastewater through technologies such as anaerobic digestion, microalgae-based processes, and chemical crystallization under the circular economy paradigm would enable water reuse and the recovery of resources contained in swine wastewater, including nutrients, energy, and other value-added compounds, thereby contributing to the sustainable development of the swine industry. Furthermore, the implementation of circularity indicators allows for the quantification of swine wastewater's potential as a technological nutrient, as well as the assessment of reductions in water consumption (decreasing the water footprint), energy usage, and other raw materials within the production cycle.

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KEYNOTE SESSION
INNOVATION FOR A CIRCULAR MODEL

MARIE-PIERRE LÉTOURNEAU MONTMINY

"Feeding the future:
Novel approaches to porcine nutrition"

Abstract

IMPORTANCE OF LIVESTOCK IN THE AGRICULTURAL SYSTEM

Livestock production is one of the fastest growing parts of the agricultural economy, driven by rising incomes, population growth and increasing demand for animal source foods. It contributes 40 percent of the global value of agricultural production and supports the livelihoods and food security of almost one billion people. Globally, livestock contributes 15 percent of total food energy and 25 percent of dietary protein (FAO, 2025). Products from livestock are renown to provide high quality protein, but also essential brain boosting micronutrients (Neumann et al., 2007) such as iron, zinc, vitamin B12 and fatty acids that are not easily obtained from other plant food products.

Livestock, and pig in particular, is a cornerstone of the agri-food system and plays a crucial role in achieving food security (Van Zanten et al., 2019); as stated above first by providing high-quality, balanced, and highly bioavailable protein and essential micronutrients, but also by supplying organic fertilizers and plant nutrients that enhance biological activity, soil biodiversity, crop yields, and long-term stabilization of carbon in soils, and by re-using by-products and food waste into high-value protein for humans.

Biosketch

Full Professor, Agricultural and food sciences - Department of animal sciences - Université Laval

Dr. Marie-Pierre Letourneau Montminy is a full professor in the Animal Science Department of Laval University in Quebec Canada.
She graduated from both AgroParisTech and Laval University for PhD PhD studying calcium and phosphorus metabolism in growing pigs and broilers. She received the award for the best PhD in animal science in France (AFZ). She then completed a post-doctoral internship on precision feeding in pigs at Agriculture and Agri-Food Canada. She is the recipient of the 2025 Gary L. Cromwell Award for Mineral Nutrition.

Her main research focus is on producing sustainable animal protein by optimizing the utilization of phosphorus, calcium and nitrogen in pig and poultry. This by understanding and quantifying the impact of factors related to the diet and to the animal and the animal requirement through animal trial, meta-analysis, and modelling. She holds a Canada Research Chair Tier 2 on *Production of sustainable animal protein.*

IMPACT OF LIVESTOCK PRODUCTION ON ENVIRONMENT

In order to meet the demands of a growing global population, agriculture needs to produce about 50 percent more food, feed and fibre by 2050 compared with the volumes it generated in 2012 (FAO, 2013). Achieving objectives of animal protein production will place additional pressure on the world's already overstretched water, land and soil resources. It is important to recognize that, over the past 50 years, livestock productivity and efficiency have increased substantially, while resource use and greenhouse gas emissions per unit of production have declined (Capper, 2020). A substantial portion of efficiency gains has been driven by the specialization of agricultural activities into single-crop or single-livestock systems, a process known as agricultural intensification (FAO, 2004), which increases output per unit of input. Consequently, nutrient cycles have become increasingly disconnected, especially that of P (Jupp et al., 2021) in many agricultural systems worldwide, including swine production systems.

Agriculture accounts for approximately 30% of global GHG emissions, with pork production contributing about 5% of global agricultural GHG emissions, equivalent to about 2% of total GHG, according to FAO inventories. In non-ruminant animal production, 60% of GHG emissions are associated with feed production, and 20% with manure management (Andretta et al., 2021). Feed is also responsible for 50% to 60% of eutrophication, while manure is the most important contributor to acidification (40% vs. 25% for feed; Méda et al., 2021). The feed production stage accounts for most impacts, primarily due to nitrate emissions from nitrogen (N) fertilizers applied to corn, wheat, and soybean crops, as well as the production and transportation of additives such as AA. In manure management, N and phosphorus (P) are among the key elements responsible for environmental impacts while ammonia is the main contributor to acidification impacts. Additionally, N and P losses contribute to severe eutrophication in many regions of the world. To preserve planetary resources, it is crucial to optimize the efficiency of P and N use. Achieving this requires an accurate and robust feeding system for N, including amino acids (AA) and P, including its interaction with calcium (Ca) which is relevant in monogastric such as pig. An important focus must be made to reduce greenhouse gas emissions from livestock systems but it's also important to recognize and enhance their positive contributions to soil health, water management, biodiversity, and ecosystem services. A holistic approach that integrates water, livestock, soil, emissions, biodiversity, and ecosystem services must be developed.

TOWARD MORE SUSTAINABLE SWINE PRODUCTION

Optimizing the efficiency of P and N use involves setting up a system that 1) accurately and robustly determines the P, Ca and AA content of feed ingredients, 2) determines precisely the P, Ca and AA requirements of animals, 3) provides these nutrients to animals as accurately as possible and 4) integrates innovative feeding strategies to optimize their utilization by animals.

Determine precisely the phosphorus, calcium and amino acids content of feed ingredients
Feed formulation is the process of combining feed ingredients to create a balanced diet that meets the nutritional requirements of animals while minimizing cost and maintaining animal health and productivity. This system should rely first on precise feed ingredient values. The most accurate method for assessing the N (amino acids) and P nutrient values of feed ingredients is digestible content, which refers to the quantity of nutrient that is not found in feces and is therefore assumed to have been digested, or, at least, has disappeared from the digestive tract. Depending on the nutrient studied and the role of the large intestine in nutrient digestion and absorption, digestibility can be evaluated at ileal level with the use of canula for AA or in the feces for Ca and P (NRC, 2012). The definition must then be nuanced according to endogenous losses; not considering endogenous losses refers to Apparent Ileal or Total digestibility and considering them to Standardized Ileal of total. For Ca, total value remains the preferred method, but recently Lee et al. (2023) have published apparent and standardized values for key feed ingredients.

However, summing the values of each feed ingredient in a formulation does not allow for the accurate consideration of digestibility-modulating factors. This is especially the case of Ca that interact with P in the gastrointestinal tract by forming insoluble and indigestible Ca–P complexes (Lautrou et al., 2021). Despite this antagonistic effect on intestinal P utilization, Ca remains essential for P into retention in bone and thus avoids its excretion in urine. Supplementing diets with exogenous phytase is a common practice, enabling the partial replacement of P and Ca in feed formulation. Efficacy depends on available substrate, phytic P, and accurate matrix.

Determines precisely the phosphorus, calcium and amino acids requirements of animals
The second element for precise P and N nutrition systems is a robust, multicriteria estimation of requirements. For AA, dynamic models, such as those from INRAporc (van Milgen et al., 2008) and NRC (2012) provide accurate prediction of nutrient requirements based on animal characteristics such as weight, gender, and protein deposition potential. These models are based on a factorial method, incorporating AA utilization efficiency, body weight gain composition, and maintenance requirements. Current knowledge of requirements in indispensable AA now allows diet formulation without a minimum crude protein (CP) requirement, without compromising pig performance (Cappelaere et al. 2024). The ideal protein concept (Mitchell, 1962), which express AA requirements as ratio relative to lysine, the first limiting AA influencing performance, is the most common way of expressing requirement when formulating pig feed.

Regarding P, the factorial approach for estimating P requirements is inspired by the methodology used for AA. It relies on digestibility requirements (NRC, 2012; Bikker and Blok, 2017) values and based on protein deposition and empty body weight utilizing modeling techniques. However, it has been shown that bone demineralization or mineralization can occur without affecting protein deposition (e.g., Gonzalo et al., 2018; Lautrou et al., 2021). While protein deposition follows a classic Gompertz function, bone ash deposition exhibits a more linear pattern (Lautrou et al., 2021). Consequently, Ca and P requirements must account the fact that skeletal tissue changes are not directly proportional to lean growth. Lautrou et al. (2020) proposed a new modeling approach in which bone mineral deposition is independent of protein gain. In this model total P and Ca requirements are determined as the sum of their contribution to bone (99% of body Ca with about 60-70% of the body P), protein and lipid tissues.

Provide these nutrients to animals as accurately as possible
We then must match the feeding supply to requirement. Animals within a herd differ from each other in age, weight, appetite, and production potential; therefore, they have different nutrient requirements that also evolve during the growth period (Pomar et al., 2015). Conventional phased feeding systems struggle to accommodate variations in nutrient requirements resulting in overfeeding for a large proportion of the herd while animals are deficient at the beginning of the phase. This issue is even pronounced in sows that receive one feed during gestation and another during lactation although their requirements varied a lot over time (Gaillard et al., 2019). The precision feeding concept enables daily adjustment of the diet to meet exact requirements of each pig within a herd, using two feeds throughout the growth period. This approach reduced N excretion by over 25% compared with a conventional three-phase system (Pomar et al., 2015). While P excretion can also be theoretically reduced to similar levels, further studies are required to optimize the balance between total P and digestible P and ensuring reduction of P excretion, as current decreases are closer to 10 %.

Developing innovative strategies
Finally, we should develop and incorporate innovative feeding strategies to optimize nutrient utilization by animals and agricultural systems. Lowering crude protein by using efficiently synthetic amino acids can reduce environmental footprint related to N depending on the production context (Cappelaere et al., 2024). Strategies such as depletion–repletion in Ca and P, based on Ca and P homeostasis mechanisms, show promise in enhancing the animal's efficiency in phosphorus utilization and reducing P excretion (Lautrou et al., 2021). Life cycle analysis tools based on precise local data can help identify the strategies to implement to reduce the environmental footprint. Given that environmental impacts such as eutrophication and climate change may not progress in parallel, multi-objective formulation strategies are essential for identifying the most effective compromises (Garcia-Launay et al., 2018).

A broader, system-wide approach to crop–livestock farming is necessary to ensure that efforts undertaken by the pig sector yield the intended reductions in environmental impact. Another key strategy to reduce the environmental impacts of pig production is to ensure better use of slurry as a fertilizer. Studies conducted in the last decades regarding requirements, low CP and depletion-repletion and phytase have demonstrated that N and P inputs and excretion in growing-finishing pigs can be reduced by about 30-40% without compromising growth performance. This optimisation allows for slurry composition to be adjusted to match crop nutrient requirements, considering pedoclimatic conditions cropping systems. Advances in animal requirement have enabled precise prediction and management of ammoniacal and total N and total P contents in slurry, as nutrient excretion corresponds to the balance between ingestion and retention (Aklikokou et al., 2026).

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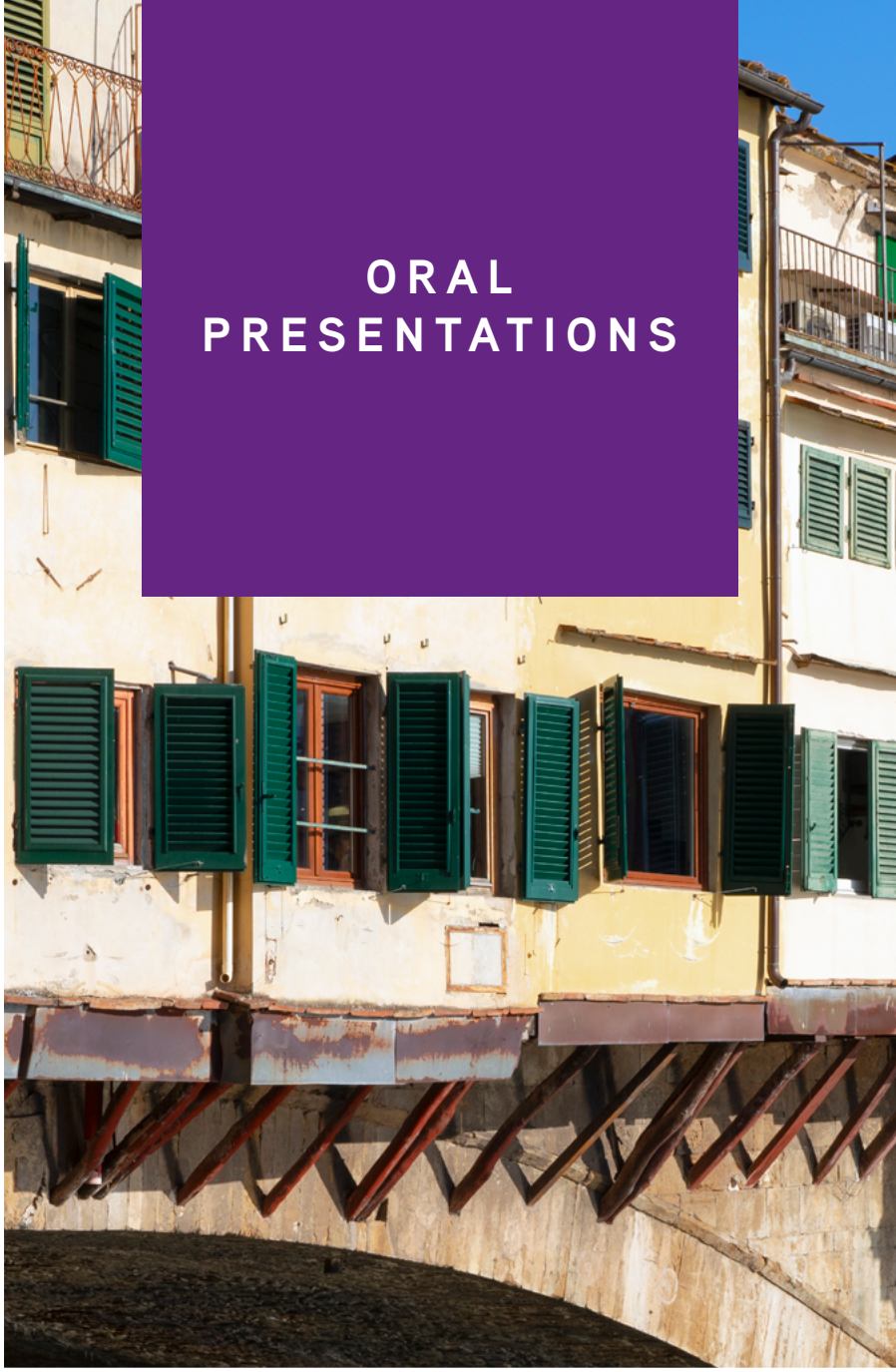
ORAL PRESENTATIONS



BBD-OP-01

PIGS WITH DIVERGENT GUT ENTEROTYPES SHOW DISTINCT RESPONSES TO AN IN VIVO CO-INFECTION CHALLENGE

A. Ucero-Carretón [3], J. Estellé [1], F. Blanc [1], A. Quirós [2], A. Montero-Benavides [2], A. Carvajal [3], H. Argüello [3]
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Background and Objectives

It is well established that the host-associated microbiome influences the response to intestinal pathogens by providing barrier effects and modulating infection outcomes. INRAe GABI group identified two distinct enterotypes in 60-day-old Large White pigs raised under identical conditions, characterized by the keystone genera Prevotella–Mitsuokella or Ruminococcus–Treponema. Based on these profiles, two lines (HPM and HRT) were divergently selected for the relative abundance of their respective keystone genera. To evaluate whether these lines differed in their response to enteric pathogens, an in vivo serial challenge was performed using 48 five-week-old piglets (24 HPM and 24 HRT) housed at the biocontention facilities of the University of Leon (Spain).

Material and Methods

After one week of acclimation, half of the animals (12 HPM and 12 HRT) were challenged with a field strain of enterotoxigenic Escherichia coli Ec156 (ETEC F18, Sta, Stb, LT positive) and monitored for ETEC F4 strain already present in the intestine. Two weeks later, all challenged pigs were inoculated with the B204 Brachyspira hyodysenteriae reference strain. Clinical diarrhoea and the target pathogens shedding was quantified daily by qPCR in the 24 challenged animals.

Results

Both infections were successful with no significant differences in the number of animals infected but significant differences were observed between enterotypes in the infection dynamics of ETEC, both in faecal excretion ($p < 0.01$) and in the daily probability of infection ($p < 0.05$). For B. hyodysenteriae, differences between HPM and HRT were also detected in the probability of infection per day ($p < 0.01$).

Discussion and Conclusion

Overall, these results demonstrate the contribution of host genetics and its interaction with the gut microbiota to disease resilience against enteric pathogens in swine. Next-future studies will attempt to disclose the mechanisms underlying these divergent infection outcomes.

BBD-OP-02

PRESENCE OF ANTIMICROBIAL RESISTANCE GENES AND PHENOTYPIC RESISTANCE IN BACTERIA ISOLATED FROM WATER LINE BIOFILMS ON U.S. SWINE FARMS

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Background and Objectives

Biofilms can be problematic for swine drinking water systems as they can harbor pathogens, antimicrobial resistance genes (ARGs), and contribute to antimicrobial failure. Water-administered antimicrobials are used for disease treatment; yet little is known about waterline ecology and the impact on antimicrobial resistance and stewardship. Mitigations to improve waterline management are available and may improve antimicrobial stewardship. Objectives of the study were to determine the presence of ARGs and evaluate the impacts of a one-time administration of 0.78% peracetic acid (PAA) on ARGs and demonstration of phenotypic resistance to chlortetracycline (CTC) and lincomycin in organisms isolated from swine waterline biofilms.

Material and Methods

Six, 2400 head, wean-to-finish sites in the United States on well water were enrolled into this longitudinal study. Waterline samples (WLS) were collected aseptically pre-treatment (0), 24 hours after the PAA application following line flushing (1), and 3, 5, 7, 14, 21, 42, 56, and 77 days post-treatment. Metagenomics were utilized to define ARGs. Phenotypic resistance was assessed from WLS through drug-infused blood agar plates with CTC or lincomycin at 200 mg/L and 80 mg/L respectively.

Results

ARGs were detected in over 96% of samples, with over 3900 ARGs reported. ARGs were associated with resistance to 14 drug classes, including aminoglycosides, beta-lactams, tetracyclines, colistin, and fosfomycin. Hemolytic F18 Escherichia coli with EAST1 toxin and PAA genes, opportunistic pig pathogens, and normal flora grew on lincomycin or CTC drug-infused plates, or both. PAA significantly reduced ARGs and increased the probability of non-resistant isolates reported post-treatment (1), however ARGs and phenotypic resistant isolates increased later post-treatment.

Discussion and Conclusion

Swine waterline biofilms serve as a reservoir for pathogens, ARGs, and antimicrobial resistant bacteria to common water-administered medications, CTC and lincomycin. 0.78% PAA may impact antimicrobial resistance initially, however management strategies long-term need to be investigated further.

BBD-OP-03

ENTEROCOCCUS SPP. AS A RECURRENT CAUSE OF NEONATAL DIARRHOEA

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Background and Objectives

Enterococcus spp. are reported to occasionally result in outbreaks of enteric disease. This study describes the investigation of recurrent enteric disease incidents throughout 2024 to 2025 in neonatal piglets on one breeding unit.

Material and Methods

Four submissions totalling 15 live piglets were submitted to an APHA Veterinary Investigation Centre to investigate the cause of neonatal diarrhoea. Piglets were euthanised, examined and sampled. Diagnostic testing included bacteriology (blood agar and MacConkey), Salmonella culture (selenite broth and brilliant green agar), coccidial oocyst count, rotavirus polyacrylamide gel electrophoresis, Clostridium perfringens toxin enzyme-linked immunosorbent assay, multiplex PED, TGEV and PDCoV polymerase chain reaction (PCR), PRRSV PCR, and histopathology.

Results

All piglets (2–5 days old) were diarrhoeic with no pathognomonic gross lesions. Non-haemolytic Escherichia coli was isolated from the intestine (15/15) and Enterococcus hirae from 6/15. One E. coli isolate possessed virulence genes for LTa and STa production, but not for common fimbriae. Rotavirus was detected in one piglet and inconclusive in one; the remaining 11 were negative. No PED, PDCoV, or TGEV were detected. 10/10 piglets were negative for C. perfringens alpha and beta toxins, and no Cystoisospora oocysts were found (3/3). Histopathological changes varied: 9/14 piglets showed brush-border colonisation by small Gram-positive cocci, and 8/14 had evidence of atrophic enteritis. 7/9 piglets had ZST scores <20 turbidity units. PRRSV was not detected (15/15).

Discussion and Conclusion

Brush-border colonization by Gram-positive cocci in multiple piglets, including some with no other structural changes to the intestinal villi, together with the isolation of E. hirae supports its possible involvement in the ongoing neonatal diarrhoea issue. Although normally commensal, E. hirae has been described as a sporadic cause of outbreaks of enteric disease. Possible contributory factors identified here include sub-optimal colostral antibody transfer and concurrent/intercurrent rotavirus infection. PRRSV was not found to be a contributory factor.

BBD-OP-04

PORCINE EAR NECROSIS: EVALUATING THE ROLE OF SECRETED FUSOBACTERIUM NECROPHORUM TOXINS IN PATHOGENESIS

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Background and Objectives

Porcine ear necrosis (PEN) results in loss of ear tissue in nursery and grower pigs and has been associated with poor growth. Our group has recently identified the cause of PEN: Fusobacterium necrophorum. This bacterium produces multiple exotoxins, which are detected in culture supernatant. The objective was to investigate if injection of culture supernatant containing F. necrophorum toxins can cause PEN lesions.

Material and Methods

F. necrophorum was cultured at 37℃ for 19 hours. Supernatant was prepared by filtration with a 0.2 µm syringe filter. Pigs (n=12 pigs, n=24 ears) were randomized into four groups (n=3/group): 1) High OD600, whole culture (H/W); 2) High OD600, supernatant only (H/S); 3) Low OD600, whole culture (L/W); and 4) Low OD600, supernatant only (L/S). On days 0 and 2 both ears of all pigs were injected with 1 ml of supernatant on the dorsal and ventral aspects. Pigs were weighed to calculate average daily gain. Mode time to tissue necrosis, sloughing off, and healing were calculated.

Results

Inoculation with F. necrophorum whole cultures (H/W and L/W) resulted in necrotic lesions in 10/12 ears. Mode times to necrosis, sloughing off, and healing were 3.5 (±0.6), 5.5 (±0.6) and 8.5 (±0.8) days, respectively for L/W. For H/W, mode times to necrosis, sloughing off and healing were 5.5 (±1.2), 8 (±1.0) and 9.5 (±0.52) days, respectively. Weight gain did not differ between groups (P=0.83). Ears inoculated with H/S and L/S had hyperemia and edema (10/12 ears) 1h after inoculation but returned to normal within 24h with no further lesions.

Discussion and Conclusion

It is likely that toxins in the supernatant do not contribute to PEN lesion development. Understanding possible virulence mechanisms will allow for further research on PEN pathogenesis and treatments.

BBD-OP-05

EMERGING PATHOGENS IN SWINE CONJUNCTIVITIS: EXPANDING THE DIFFERENTIAL DIAGNOSIS

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Background and Objectives

Conjunctivitis is commonly observed in nursery and fattening pigs but is rarely further diagnosed or treated as most cases are self-limiting and of minor economic relevance. Its occurrence is linked to non-infectious factors and microbial colonization. Chlamydia (C.) spp., Chlamydia-related organisms, and Mycoplasma (M.) hyorhinis are frequently involved, while viruses such as porcine cytomegalovirus likely play a secondary role. A novel Mycoplasma species, M. hyoculi, has recently been isolated from affected pigs. Shifts in the ocular microbiome may also contribute. With this study we aimed to investigate pathogens involved in conjunctivitis in Austrian pig farms.

Material and Methods

Conjunctival swabs from 100 nursery/fattening pigs and gilts with conjunctivitis originating from 37 Austrian herds were collected and stored in transport medium at –80°C. Samples were analysed for M. hyorhinis and M. hyoculi (PCR, culture), porcine cytomegalovirus (PCR), Chlamydia spp. (qPCR, culture), Chlamydia-related organisms and general conjunctival microbiome (amplicon metabarcoding).

Results

While cytomegalovirus and environmental chlamydia were not detected by PCR and/or cultivation, Chlamydia suis was isolated in 75% of samples. M. hyorhinis was detected in 33% (PCR) / 15% (culture), M. hyoculi in 87% (PCR)/34 % (culture) and M.hyosynoviae in 2% (culture). Microbiome data showed that most samples were dominated by Mycoplasmatales. Microbial diversity and composition varied between nursery, fattening pigs, gilts and sows. Isolation success was highest in early stages of conjunctivitis and in younger pigs; the longer the clinical course, the lower the cultivation success.

Discussion and Conclusion

M. hyoculi was the most prevalent bacterium detected in conjunctivitis cases, followed by Chlamydia suis. This is the first study demonstrating the widespread occurrence of this new Mycoplasma species in Austrian pig herds, highlighting its relevance as differential agent involved in the cause of conjunctivitis. Age-related differences in microbiome composition suggest an influence of immune status. Findings support a complex, polymicrobial etiology of swine conjunctivitis.

BBD-OP-06

REDEFINING THE GENETIC BOUNDARY BETWEEN ACTINOBACILLUS PLEUROPNEUMONIAE SEROTYPES 9 AND 11

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Background and Objectives

Actinobacillus pleuropneumoniae is a major agent of porcine pleuropneumonia, with serotype 9/11 ranking among the most prevalent and clinically relevant in Europe. Their accurate differentiation is essential for epidemiological surveillance, yet remains challenging due to strong antigenic and genetic similarity. A single-nucleotide insertion in the cpsF locus, which modifies a glycosyltransferase involved in capsule biosynthesis, has been proposed as the unique genetic feature distinguishing serotype 9 from 11 reference strains. This study aimed to design a LNA-qPCR assay targeting this mutation and to assess its performance in a broad European isolate collection.

Material and Methods

A total of 134 European isolates previously identified as serotype 9/11 were analyzed using the novel LNA-qPCR and partial cpsF sequencing (Sanger) to confirm the reference mutation. Additionally, 12 Hungarian isolates serotyped by IHA were analyzed through full cpsF sequencing using ONT MinION, and 19 further isolates, including serologically confirmed serotype 9 and 11 strains, underwent WGS to characterize their cps and O-Ag loci.

Results

The LNA-qPCR accurately distinguished the reference strains of serotypes 9 and 11. However, all 134 field isolates lacked the single-nucleotide insertion defining serotype 9 and were identified as serotype 11. Among the Hungarian isolates, discrepancies emerged between LNA-qPCR results (serotype 11) and prior IHA identification (serotype 9). Complete cpsF sequencing revealed diverse deletions, insertions, and truncations generating non-functional or altered glycosyltransferases leading to a serotype 9 capsule. WGS confirmed these heterogeneities and revealed further variability within the cpsF locus.

Discussion and Conclusion

The study demonstrates that the cpsF mutation used to distinguish serotypes 9 and 11 in reference strains is not conserved in European field isolates. Multiple independent cpsF variants can produce a serotype 9 phenotype, making single-target PCR assays insufficient. Comprehensive cpsF analysis emerges as the only reliable approach, offering a framework to redefine A. pleuropneumoniae serotype epidemiology across European regions where 9/11 is particularly relevant.

BBD-OP-07

EXPERT KNOWLEDGE ELICITATION OF MODEL-BASED EPIDEMIOLOGICAL PARAMETER ESTIMATION FOR MYCOPLASMA HYOPNEUMONIAE INFECTION

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Background and Objectives

Mycoplasma hyopneumoniae is a globally prevalent bacterium in pig herds and a major contributor to the porcine respiratory disease complex. SEIR compartmental models provide valuable insights into infection dynamics. However, their robustness depends on accurate epidemiological parameters, many of which remain poorly documented for M. hyopneumoniae. This study addresses these knowledge gaps by eliciting key parameters under natural infection conditions during the wean-to-finish period.

Material and Methods

An Expert Knowledge Elicitation (EKE) was conducted using the Delphi methodology. The survey included questions on: (i) the percentage of subclinical infections, (ii) the transmission rate of subclinically infectious animals (R_s), (iii) the transmission rate during chronic infection (R_c), (iv) the percentage of exposed animals that do not become infectious, and (v) the influence of coinfections on several M. hyopneumoniae model parameters. Due to uncertainty surrounding these parameters, five experts were asked to provide probability distributions rather than an exact value for the first four questions, and a percentage variation for the last one.

Results

Estimates for all inquired parameters were successfully obtained; however, for questions (i) and (iv), a consensus estimate could not be reached due to high variability among responses. Nevertheless, two plausible field scenarios were derived from the data. For example, the median percentage of subclinical infections was 11.8% in the first scenario and 50% in the second. Similarly, high variability was observed in the estimated impact of certain respiratory coinfections on model parameters. For the different transmission rates, a single consensus distribution was achieved, which was similar for both rates: PERT(0.2, 0.5, 1.7) for R_s, and PERT(0.2, 0.5, 1.2) for R_c.

Discussion and Conclusion

The EKE was completed successfully, yielding estimates for ambiguous M. hyopneumoniae model parameters. Variability in some parameter distributions underscores the uncertainty surrounding the epidemiology of the infection and highlights areas for further research.

HHM-OP-01

DETERMINANTS OF SUCCESS FOR PRRSV HERD-STABILIZATION PROGRAMMES AMONG EUROPEAN PIG VETERINARIANS

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) remains a major health and economic challenge for the pig-production sector due to the complexity of control. Although combined vaccination and biosecurity strategies are widely used, their implementation and effectiveness vary. This study aimed to identify determinants of successful PRRSV stabilization programmes based on a survey among European pig veterinarians.

Material and Methods

A cross-sectional survey was carried out in Dec 2023 – Jan 2024 among 108 swine veterinarians in 22 European countries to collect their experience in PRRS management. Variables collected were organized into six blocks (socio-professional, country, professional exchanges, Evidence based veterinary medicine (EBVM) engagement, PRRSV context/regulation, and perceived programme success). After univariate selection ($p<0.15$), 71 variables were retained for multivariate analysis. We used a regularized generalized canonical correlation analysis (rGCCA) to identify and quantify interconnections between veterinarians' profiles and their PRRSV management approach. Two components per block were extracted and stability was assessed by resampling.

Results

The first component reflected veterinarians who implemented stabilization programmes sometimes with success or not. It was positively associated with veterinarians working in large companies (>50 employees, $p<0.05$), holding additional postgraduate qualifications ($p<0.05$), and reporting frequent teamwork ($p=0.008$) and systematic performance monitoring ($p=0.002$). This component also correlated with a higher PRRSV prevalence ($p=0.002$) and with standardized diagnostic procedures within their company ($p<0.001$). The second component represented veterinarians achieving full stabilization success, mainly driven by country-level effects ($p<0.001$). It was also associated with regular exchanges with authorities ($p=0.006$), good access to vaccines and diagnostic tools, and a consistent though pragmatic application of EBVM principles ($p=0.002$).

Discussion and Conclusion

PRRS stabilization programmes success is multifactorial: organisational scale, internal teamwork, access to diagnostics/vaccines, professional exchanges with authorities, and national context jointly determine outcomes. The rGCCA provides a robust, interpretable approach to disentangle these interdependencies and to inform targeted, context-specific interventions to improve PRRSV control.

HHM-OP-02

AFRICAN SWINE FEVER (ASF) IN LOMBARDY: A STUDY TO IDENTIFY RISK FACTORS ASSOCIATED WITH THE INTRODUCTION OF ASF INTO PIG FARMS

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Background and Objectives

The first occurrence of African swine fever (ASF) in Lombardy was reported in 2023, nine outbreaks in pig farms were detected and eradicated just over a month after the epidemic began. Nevertheless, the infection continued to spread among wild boar and in July 2024 another 21 outbreaks were identified in pig farms. To identify risk factors associated with ASFV introduction, a case-control study was conducted. The aim of the study was to gain knowledge of the risk and protective factors for the introduction of ASFV into pig farms.

Material and Methods

The study was conducted in an area subject to restrictions due to the presence of ASF. For each outbreak of the 2024 epidemic, two ASF negative farms were identified, matched by location and farm type. On both case and control farms, a questionnaire related to farm location and biosecurity was carried out. Risk factors were selected based on the relevant literature and their association with ASF occurrence evaluated using conditional logistic regression and odds ratios (OR).

Results

The risks of introducing ASFV into pig farms increased when farmer house was within the farm boundary (OR=20.0;p=0.004), when farm workers had contacts with other pig farms (OR=10.83;p=0.026), and when manure was flowing from buildings to slurry pit by vehicle (OR=11.68;p=0.022). While were found to be protective factors: the presence of hygiene lock (OR=0.09;p<0.001), the loading of dead pigs carcasses outside the farm (OR=0.11;p=0.043) and when farmers had crops holding far from the farm buildings (OR=0.21;p=0.019).

Discussion and Conclusion

In the domestic pig sector, human activities are considered the main driver of ASFV spread. However, EFSA recently reported that the exact route of virus introduction into farms is rarely explained. This study identifies risk factors for the introduction of ASF into farms, as well as protective factors.
This information could be useful for improving pig farms biosecurity.

HHM-OP-03

PRIORITIZING FARM BIOSECURITY PRACTICES FOR PREVENTION AND CONTROL OF SWINE INFLUENZA IN PIG HERDS

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Background and Objectives

Swine influenza A virus (swIAV) is a major respiratory pathogen in pigs, causing significant economic losses (reduced productivity and increased veterinary costs) and impacting both animal and human health and wellbeing. Therefore robust on-farm biosecurity practices, accompanied by vaccination programs, remains the most sustainable strategy for prevention and control of (swIAV). The objective of this study was to review and compile current on-farm prevention and control practices for swIAV and to identify biosecurity measures with the highest preventive potential.

Material and Methods

Two complementary approaches were applied: (i) a systematic review of peer-reviewed literature from the Web of Science database, and (ii) an expert opinion survey. In total, six external and five internal biosecurity topics, and 96 biosecurity measures were initially considered as important for prevention of swIAV. According to the literature, from 322 initial publications, 124 were deemed relevant for presenting and evaluating biosecurity measures against swIAV. Additionally, 19 swine health and biosecurity experts assessed the importance of biosecurity topics and measures via an online questionnaire.

Results

Literature most frequently reported 'Animal Flow' as a critical biosecurity topic, and the most effective measure was 'Cleaning and disinfection of animal transport vehicles'. Experts highlighted 'Purchase/Introduction of breeding pigs and piglets' and 'Animal Flow' as top priorities considering the biosecurity topics. Measures prevents entrance and internal movements of animals and humans were considered as the most impactful for prevention.

Discussion and Conclusion

Findings confirm that controlling swIAV requires a multi-layered biosecurity approach, focusing on external introductions and internal spread. The literature stresses transport hygiene, and expert consensus underscores animal sourcing and movement control as pivotal. This study highlights existing research gaps and identifies priorities for future research based on discrepancies between the scientific literature and expert prioritization of farm biosecurity.

HHM-OP-04

PRODUCER PERCEPTIONS OF MEDICATION SAFETY IN SOWS: RISKS AND DEFENSES IN FINNISH FARMS

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Background and Objectives

Medication is essential for maintaining health and welfare. However, a complex medication management and use (MMU) process in farms may pose risks to medication safety, potentially leading to errors in medication use. Despite their importance, these issues remain largely unexplored. This qualitative study aimed to identify the risks and defenses associated with the MMU process in sows on Finnish farms. Our study comprised medication instructions, herd health visits, assessments of the need for medical treatment for sows, medication administration, treatment monitoring, record-keeping, and medication error monitoring. Risks were identified as factors that compromise safe medication use, while defenses referred to practices that prevent errors and support safety.

Material and Methods

A convenience sample of 14 Finnish sow farms having 150-1,150 sows was recruited for the study in spring 2023. The corresponding author visited the farms once and interviewed the person responsible for sow medications using a semi-structured interview guide. The interviews were transcribed and transferred to Atlas.ti© for abductive content analysis.

Results

The identified risks comprised poor adherence to medication instructions, difficulty assessing the need for medical treatment, a lack of knowledge in handling sows, inadequate monitoring practices, and flawed medication record-keeping. Defenses included clear medication instructions, adequate veterinary support, effective diagnostic methods, and competence in administering medication, including proper sow handling and administration skills.

Discussion and Conclusion

The interviews revealed several risks and defenses across all phases of the MMU process in sows. The present study, being the first of its kind, suggests that improving communication, providing adequate staff training, and streamlining documentation practices could enhance medication safety and effectiveness in sows. Preventive, systems-based medication risk management on Finnish sow farms requires further development to ensure safe and effective care in the future.

HHM-OP-05

PORCINE EAR NECROSIS: EXPLORATION OF PATHOGENIC MECHANISMS VIA AN HISTOLOGICAL STUDY

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Background and Objectives

Porcine ear necrosis (PEN), a dermatosis that afflicts mainly post-weaning pigs, is characterized by necrotic and ulcerative lesions of the pinna. Despite its frequency, its etiopathogenesis remains poorly understood. This study aims to describe the clinical and lesion progression of PEN to better understand its pathophysiology.

Material and Methods

The study involved 95 pigs (78 affected, 17 controls) from three french farms. Biweekly clinical observations including macroscopic scoring from 1 (superficial lesions at the apex) to 4 (extensive lesions with tissue loss) and bacteriological and histological samplings were performed.

Results

Macroscopic lesions were consistently bilateral, sometimes symmetrical, starting at the apex of the ear and extending along the edges and/or in depth. Hyperthermia was observed from stage 1 suggesting an early systemic response. Opportunistic pathogens (Staphylococcus aureus, S. hyicus, and Streptococcus dysgalactiae) were isolated in both affected and control piglets, giving little support for a primary bacteriological mechanism. Histologically, lesions exhibited necrosis, ulceration, and inflammatory exocytosis of the epidermis, with serocellular crusts on the surface and vascular damage. Marked epidermal hyperplasia and deep dermal inflammation with predominance of neutrophils contrasted with the superficial lymphocytic perivascular infiltrate of control pigs. Histological profiles changed little across macroscopic clinical stages, but severe forms exhibited an acute, diffuse and destructive inflammatory phenotype, combining extensive epidermal damage, vasculitis and marked dermal inflammation. In particular, two major lesions appeared to contribute to the exacerbation of ulcerative changes: the vasculitis observed in early stages, suggesting a primary vascular origin and a marked reduction in dermal lymphocytes accompanied by a neutrophilic shift, suggesting dysregulated immune mechanisms. Further investigation is required to determine whether these two mechanisms operate independently and whether their initiating factors are primarily management-related (e.g. weaning) or infectious.

Discussion and Conclusion

This study validates a visual lesion scoring and highlights early clinical signs (hyperthermia), early inflammatory and vascular mechanisms, guiding future research particularly towards immune mechanisms.

HHM-OP-06

VALIDATING COMPUTER VISION SYSTEMS USED TO MONITOR CHRONIC PLEURISY

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Background and Objectives

Information about prevalence of chronic pleurisy in finishing pigs is of importance to pig producers, because it is an indicator for respiratory health and productivity. Routine registrations at post-mortem inspection can reveal this information, but these registrations are known for being inaccurate. A computer vision system (CVS) taking images of carcasses developed by the Danish Technological Institute is installed at a large Danish pig abattoir. Maybe those images could provide the necessary and accurate information?

Material and Methods

The performance of three convolutional neural network (CNN) models based on different CNN architectures, developed to detect chronic pleurisy in the chest cavity, was evaluated in comparison with meat inspector judgement. We used Bayesian latent class modelling to estimate sensitivity and specificity of the meat inspector's judgement and the CVS. Data from 85,413 pig carcasses across 15 slaughter days were included in the analysis.

Results

The agreement between the meat inspectors and the CVS was judged as moderate when using Cohen's kappa (| =0.72-0.77) and near perfect (| =0.86-0.89) when using prevalence- and bias-adjusted kappa. The CVS models demonstrated superior sensitivity (84.7-90.3%) compared to the meat inspectors (79.4-83.0%), while the meat inspectors maintained slightly higher specificity (99.7-99.9% versus 97.6-98.8%). The ResNeXt-101 architecture with 1024-pixel resolution (CVS-Complex-HighRes) performed best overall, while aggregating outputs from multiple CVS models improved specificity without compromising sensitivity (CVS-Consensus).

Discussion and Conclusion

The study demonstrates that accurate registrations can be made by this CVS alone, which has become relevant, because since mid-2025 recordings of chronic pleurisy are considered redundant by the Danish competent authority. Our findings support the implementation of CVS technology within risk-based meat inspection frameworks to ensure that relevant information of high quality reaches the pig producers. Bayesian latent class modeling proved very adequate for comparing two imperfect tests, because it is independent of a gold standard to estimate sensitivity and specificity.

IMM-OP-01

CYTOKINES AND BIOMARKERS ASSOCIATED WITH CLINICAL OUTCOMES IN PIGS INFECTED WITH A HIGHLY VIRULENT PRRSV-1 ROSALIA STRAIN

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) is one of the most important swine diseases. The emergence of highly virulent PRRSV-1 strains has been associated with severe clinical outcomes. This study aimed to evaluate the potential of cytokines and biomarkers related to inflammation, immune response, sepsis, tissue damage and oxidative stress – measured in serum and saliva - to predict disease outcome in pigs experimentally infected with a highly virulent PRRSV-1 Rosalia strain.

Material and Methods

Thirty-five eight-week-old PRRSV-free pigs were divided into four groups. Groups 1-3 (n=10 per group) were inoculated with a PRRSV-1 Rosalia strain ($2x10^5$ $TCID_{50}$) either intranasally (groups 1 and 2) or intramuscularly (group 3). Groups 1 and 2 represented independent intranasal infection experiments, with group 2 derived from a separate validation study. Group 4 (n=5) served as non-infected controls. Groups 1, 2 and 4 were used to identify cytokines and biomarkers associated with clinical outcome, while group 3 was used for validation. Animals were monitored for 28 days post-infection (DPI), and serum and saliva samples were collected for virological, cytokine and biomarker quantification. Associations between clinical signs, viral load, and cytokine or biomarker levels were assessed using the Spearman correlation test.

Results

Intranasal infection induced mild to moderate clinical signs, whereas intramuscular inoculation caused severe disease with 100% mortality by 14 DPI. Acute phase proteins, such as C-reactive protein (CRP) in serum and haptoglobin (HP) in saliva, together with IFN-ɣ in serum and IL-6 in saliva at 3 DPI, accurately predicted clinical severity and viral load. The intramuscularly infected group confirmed the predictive value of these analytes.

Discussion and Conclusion

This study demonstrates that specific cytokines (IFN-ɣ, IL-6) and acute phase proteins (CRP, HP) are strongly associated with clinical severity and viral load in PRRSV-infected pigs soon after infection. These findings pave the way for studying the pathogenic mechanism involved with a special focus on early intervention strategies.

IMM-OP-02

MODULATING INFLAMMATORY PATHWAYS AND GUT MICROBIOTA THROUGH PRECISION FEEDING IN IMMUNOCASTRATED PIGS

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Background and Objectives

This study aimed to evaluate the effects of daily feeding per individual (DFI) compared to a phase-feeding program (PF) on the immune response, gut microbiota composition, metabolic biomarkers, and oxidative stress status in immunocastrated pigs.

Material and Methods

A total of 50 entire male pigs (Landrace × Large White; HS Genetic – BRF S.A., Curitiba, Brazil), with an average initial body weight of 23.2 ± 3.12 kg, were randomly assigned to PF (provided all pigs with five phases in this group) or the DFI (it was designed to attempted 100% of the estimated nutrient requirements of single individual pig, using automatic and intelligent precision feeders). The trial lasted 104 days. All animals were immunocastrated (days 44 and 86 of the experiment). Blood samples were collected from seven pigs per treatment on days 1, 21, 26, 83, 98, and 104 to assess a panel of metabolic biomarkers, oxidative stress indicators, and inflammatory cytokines. Fecal samples from the same pigs were collected on days 20, 25, and 103 to evaluate fecal concentrations of fatty acid-binding proteins (FABP) and calprotectin, and for microbiota analysis.

Results

No differences were observed between treatments for biochemical parameters, oxidative stress markers, FABP or calprotectin levels ($P<0.05$). However, levels of tumor necrosis factor-alpha and interleukin-10 were significantly higher in the PF group on day 104 ($P < 0.050$). Although no overall treatment effect was detected in alpha or beta diversity ($P > 0.050$), a significant reduction in alpha diversity was observed in the PF group from day 20 to day 103 ($P = 0.012$). Furthermore, age was a significant and consistent predictor of variation in beta diversity ($P < 0.0001$). DFI influenced the abundance of specific bacterial genera.

Discussion and Conclusion

Therefore, individual precision feeding reduced inflammatory activation compared to the multiphase feeding system. Microbial diversity shifted over time, particularly after the second immunocastration dose.

IMM-OP-03

INVESTIGATION OF COMPLAINTS RELATED TO VACCINE FAILURES

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Background and Objectives

Vaccination is a cornerstone of disease prevention in swine, reducing pathogen circulation, antimicrobial use and improving welfare. Nevertheless, field reports of suspected lack of expected efficacy (SLEE) challenge confidence in vaccine performance and complicate herd management. Our objectives were identify common causes of SLEE and inform mitigation strategies by analyzing five years of field investigations.

Material and Methods

From 2019–2024, the Veterinary Technical Services reviewed >100 SLEE complaints from commercial swine operations. Investigations collected standardized data on vaccinated pigs (number, age), vaccination–disease timing, products used (lot, expiry), vaccination protocols, and slaughter/post-mortem findings. Laboratory analyses (serology, PCR, tissue diagnostics) assessed vaccine response, maternal antibody interference, the presence and timing of infection, and circulating pathogens across production phases.

Results

Investigations revealed recurrent contributors to apparent vaccine failure. Improper vaccination practices accounted for approximately 10% of cases; in these, 10–50% of sampled pigs had undetectable antibody titers due to failed administration or poor immune response. Additional operational causes included product mixing, off-label use, and schedules misaligned with herd challenge. Novel viral strains not targeted by the vaccine were implicated in 23% of investigations. Viremia at vaccination was detected in 20% of cases, and suboptimal timing explained 12% of complaints. Despite comprehensive inquiry, 20–25% of investigations remained inconclusive owing to non-representative sampling, insufficient data, or ambiguous laboratory results.

Discussion and Conclusion

SLEE events are multifactorial, combining management, product, pathogen and sampling issues. Key actions to reduce apparent failures include rigorous vaccination audits (technique, coverage, cold chain, product compatibility), aligning vaccination timing with herd-specific challenge risk, enhanced sampling for diagnostic confirmation, and surveillance for emergent strains. Incorporating slaughter and post-mortem data into routine monitoring enhances detection of vaccine escape versus operational shortcomings. Where investigations remain inconclusive, structured farm audits and targeted sampling plans are recommended to resolve uncertainty and guide corrective actions.

IMM-OP-04

ACTIVATION OF T CELL SUBPOPULATIONS FOLLOWING TBPB-Y167A IMMUNIZATION AND GLAESSERELLA PARASUIS CHALLENGE IN COLOSTRUM-DEPRIVED PIGLETS.

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Background and Objectives

Glaesserella parasuis (G. parasuis) causes a severe systemic infection in swine, with high morbidity and mortality. The absence of broadly protective commercial vaccines is related to the genetic diversity of circulating strains. Subunit vaccines are a promising strategy for stronger and longer-lasting immunity, and this study aimed to characterize the cellular immune mechanisms induced by a modified TbpB (Y167A) vaccine in colostrum-deprived piglets, focusing on T lymphocyte subset dynamics after G. parasuis challenge.

Material and Methods

Ten colostrum-deprived piglets were divided into immunized and non-immunized groups. Cellular immune responses were evaluated at baseline, after each of the two oral vaccine doses (days 30 and 45 of age), and following intranasal challenge with G. parasuis (1 and 3 dpi). Peripheral blood mononuclear cells (PBMCs) were isolated and analyzed for major leukocyte populations (monocytes, natural killer cells, and B and T lymphocytes) and five key T cell subsets (TCR©™, CD8⁺ ⟨®, naïve and memory CD4⁺, and double-negative ⟨® cells) using flow cytometry. PBMCs (5×10^5 cells/well) were distributed in 96-well microplates and labelled using hybridoma supernatants (sIgM, CD8⟨, CD172a, CD3, ©™TCR, CD4, CD27 and CD8®). Isotype-matched monoclonal antibodies served as negative controls. Statistical analysis included standard parametric tests and generalized linear models; statistical significance was set at $p<0.05$.

Results

All T cell subsets expanded significantly in immunized piglets only after the second dose ($p<0.01$) before G. parasuis infection. No significant differences were found in major leukocyte populations post-challenge, but immunized animals demonstrated rapid maturation in the CD8⁺ compartment from days 1 to 3 ($p<0.02$).

Discussion and Conclusion

Immunization with the modified TbpB antigen elicits a strong and broadly diversified activation of T cell subsets, reinforcing adaptive immunity against G. parasuis. The accelerated conversion to CD8⁺ memory cells following infection underscores the effectiveness of vaccine-induced priming and highlights a promising avenue for deeper molecular exploration aimed at optimizing heterologous protection strategies.

IMM-OP-05

EVALUATING THE PERFORMANCE OF A VEROTOXIN TOXOID VACCINE ON A SOUTH AFRICAN COMMERCIAL PIGGERY

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Background and Objectives

Verotoxin-Associated Syndrome (VAS), driven by the systemic action of verotoxin 2e (Vt2e) from verotoxigenic Escherichia coli (STEC/VTEC), is an increasingly recognized cause of subclinical morbidity that compromises pig welfare and impairs production performance. The objective of this study was to evaluate the efficacy of a Verotoxin Toxoid vaccine in mitigating VAS impact, specifically in a commercial field setting where clear clinical Edema Disease was absent, but ear necrosis and growth performance impairment were reported.

Material and Methods

A prospective, controlled field study enrolled 2 016 piglets to either a non-vaccinated control group (n=1,027) or a group vaccinated (n=989) with a verotoxin toxoid vaccine (VEPURED®, 1 ml/IM at 2 days of age) on four consecutive batches. Production parameters (average daily gain (ADG) and mortality) were monitored from weaning to slaughter. Ear necrosis was scored by Malik et al system by a blinded observer at 6.5 and 9.5 weeks. Data were analysed via regression models to determine statistical significance.

Results

A significant reduction in the prevalence and severity of ear necrosis was observed in the vaccinated group at both assessment points ($p<0.001$). At 9.5 weeks, 68.4% of vaccinated pigs were symptom-free vs. 28.3% of controls. While nursery mortality was not significantly different ($p=0.217$), mortality during the fattening period was significantly lower in the vaccinated group (2.9%) than in the control group (5.3%; $p=0.012$). No statistically significant differences were found for ADG or final slaughter weight ($p>0.05$), though vaccinated pigs were numerically heavier (+2.16 kg).

Discussion and Conclusion

The study demonstrates that vaccination with VEPURED® mitigates the disease sequelae of VAS, representing a direct economic benefit. The concurrent marked reduction in ear necrosis lesions further confirms the vaccine's ability in improving animal welfare. These findings validate the value of a vaccination strategy for controlling VAS and the associated production losses.

IMM-OP-06

MODULATION OF IMMUNE CELL ACTIVATION BY A VACCINE WITH INFLUENZA PROTEIN ANTIGEN AND TWO POLYMERIC ADJUVANTS IN A MURINE MODEL

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Background and Objectives

Successful swine vaccine development relies on the ability to induce a targeted immune response by activating well-defined immune pathwaysHere we present the ability of two polymeric adjuvants to initiate CD4 or CD8 response, in the murine model.

Material and Methods

C57BL/6 were used for a comparison of vaccines made with the Influenza wild-type NP recombinant protein (Ag) alone or formulated in Ictyolane 50 polymer dispersion (Pol1) or Ictyolane 50D polymer dispersion with an amphiphilic immunostimulant (Pol2). Mice were injected twice 28 days apart with 50µl and bled at days 28 , 42, and at sacrifice day 56. Half of the groups were sacrificed at day 38, Spleens and lungs were harvested for the analysis of antigen specific cellular immune responses by flow cytometry and ELISPOT

Results

Adjuvanted formulations induced significantly higher antibody titers than antigen alone (>0.001). Pol2 elicited Th1 immune response after prime immunization (IgG2c/IgG1>1), whereas Pol1 induced Th1 response after booster dose. Pol1 triggered a CD4 T cell response in the spleen (60% CD44+ cells among CD4+ population). In contrast, Pol2 induced a strong CD8 T cell response in both the spleen and lungs (60% CD44+ cells among CD8+ population), characterized by polyfunctional T cells (IFN-©,TNF-a and IL-2 producing cells). Pol1 generated central memory T cells (TCM) in the spleen, whereas Pol2 promoted effector memory T cells (TEM) in both spleen and lung, with higher frequency of lung-resident memory T cells (TRM) within the lung parenchyma (CD8+/CD45iv-/CD1013+/CD69+ cells).

Discussion and Conclusion

This study demonstrates that immune responses can be precisely studied and modulated in a mouse model using two well-defined and safe polymeric adjuvants. Each adjuvant generates distinct immune profiles, highlighting the ability to tailor vaccine-induced immunity. These findings support the application of these polymeric adjuvants to different swine vaccines, where controlled immune polarization is critical for efficacy.

REP-OP-01

INFLUENCE OF DIFFERENT SOW AND FARROWING PARAMETERS ON COLOSTRUM QUALITY IN A FREE FARROWING SYSTEM

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Background and Objectives

Colostrum is vital for neonatal piglets, with both quantity and quality determining survival and performance. Inadequate colostrum quality is a major risk factor for impaired health, growth and welfare. This study aimed to investigate the influence of sow and farrowing parameters on colostrum immunoglobulin concentration.

Material and Methods

In total, 151 crossbred sows housed in free-farrowing pens were included. Sow-related data (parity, body weight, body condition score, backfat, birth induction, gestation length) and farrowing parameters (total piglets born, farrowing duration, obstetrical intervention, placental expulsion, litter and placental weight) were recorded. Ambient temperature and humidity were recorded within 24 hours prior to farrowing. Colostrum samples were collected after the expulsion of the first piglet and analysed for IgG concentration using ELISA, with parallel measurement by digital Brix refractometry.Linear regression with log-transformed IgG values was applied. Predictor variables were selected based on biological plausibility and descriptive analyses; the final model included total piglets born, parity, induction of farrowing, relative humidity, and the parity × induction interaction.

Results

Brix values strongly correlated with ELISA IgG ($r = 0.66$, $p < 0.001$). The final model ($R^2 = 0.43$, $p < 0.001$) revealed significant effects of parity ($p < 0.001$), birth induction ($p = 0.001$), humidity ($p = 0.004$), and the interaction between parity and induction ($p = 0.034$). Higher parity was associated with increased IgG levels, whereas birth induction reduced IgG, particularly in gilts, with diminishing effects in older sows. A positive association between ambient humidity and IgG was observed, though its biological relevance is unclear.

Discussion and Conclusion

In conclusion, parity, birth induction, and environmental factors significantly influenced colostrum IgG. The negative impact of birth induction highlights the importance of farrowing management. On-farm colostrum assessment by Brix refractometry appears feasible for integration into sow and piglet management in free-farrowing systems.

REP-OP-02

PREDICTING REPRODUCTIVE SUCCESS IN REPLACEMENT GILTS USING MACHINE LEARNING: INSIGHTS FROM GROWTH AND PERFORMANCE TRAITS

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Background and Objectives

Efficient gilt management is essential to the profitability of swine production. Identifying early-life factors that predict whether gilts will reach first insemination can optimize selection and reduce non-productive days. The objective of this study was to evaluate the predictive capacity of growth and performance traits using machine learning models.

Material and Methods

Data were collected from 346 gilts from birth until the potential first mating phase. The binary target variable indicated insemination status (1 = yes; 0 = no). The eleven predictors included birth weight, litter size traits, the female selection ratio, transition weight (on day 46), body weight at 220 days, and average daily gain (ADG) across phases. Logistic regression and random forest algorithms were applied using Orange Data Mining v3.9 with stratified 10-fold cross-validation. The performance metrics included the area under the curve (AUC), accuracy, precision, and specificity.

Results

Random forest outperformed logistic regression (area under the curve [AUC] = 0.74 vs. 0.52; accuracy = 0.78 vs. 0.71). Logistic regression showed limited discriminative power, indicating nonlinear relationships between predictors and reproductive success. Positive predictors included birth weight (OR = 1.71), transition weight (OR = 1.46), and average daily gain (ADG) from birth to transition (OR = 1.04), while body weight at 220 days was negatively associated (OR = 0.87). Random Forest ranked ADG from birth to transition as the most influential predictor, followed by ADG from transition to mating, birth weight, the female-to-male ratio, and transition weight. These results underscore the importance of early growth trajectories and complex interactions in determining reproductive success.

Discussion and Conclusion

Machine learning models, particularly Random Forest models, demonstrate moderate-to-good predictive capacity for gilt reproductive success. It is critical to monitor and manage growth from birth through transition to ensure gilts reach their first mating at an optimal physiological stage.

REP-OP-03

MICROBIOME MATURATION FROM GESTATION TO LACTATION: LINKS BETWEEN GUT MICROBIOTA AND REPRODUCTIVE PERFORMANCE IN SOWS.

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Background and Objectives

The gut microbiome changes through out the reproductive cycle and influence sow reproductive performance. In humans, the third trimester is known to be highly inflammatory. Based on this, we hypothesize that high performing sows are able to transition away from this inflammatory state postpartum, whereas low performing sows remain in a more inflammatory condition, negatively impacting their performance.

Material and Methods

To test this hypothesis, data were collected from 200 multiparous sows across six European countries using fecal swabs, which were analyzed through 16s rRNA long-read amplicon sequencing. Each sow was sampled at day 109 of gestation and day 21 of lactation. Sow performance was assessed based on the number of weaned piglets per sow per year. Based on this parameter, sows were classified into four groups: high performers in gestation, high performers in lactation, low performers in gestation, and low performers in lactation.

Results

The microbial composition of the four sow performance groups differed significantly ($P<0.01$, $F=7.4$, $R2=0.1$). Notably, low performing sows in lactation clustered between high performing sows lactation sows and the two gestation groups. This pattern suggests that low performers in lactation did not exhibit the same microbial shift observed in high performers during lactation, remaining closer to the gestation-associated microbiota. Further analysis identified six species that were differentially abundant between high and low performers, all showing a negative correlation with performance. Among these were Escherichia coli and Streptococcus suis¸ both of which are commonly associated with health challenges in swine.

Discussion and Conclusion

In conclusion we see indications of a microbiome maturation taking place from gestation to lactation with possible impacts on the performance of the sows. Our findings suggest a possible inflammatory state in the different groups but gives new insight into the state of the sows and when to try to limit stress.

REP-OP-04

WIDESPREAD OCCURRENCE OF CHLAMYDIA SUIS IN AUSTRIAN SOW FARMS: LACK OF ASSOCIATION WITH REPRODUCTIVE DISORDERS OR TETRACYCLINE USE

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Background and Objectives

Chlamydia (C.) suis is associated with reproductive disorders in sows. This study assessed epidemiological relevance and tetracycline susceptibility in Austrian sow-herds with and without reproductive-problems, and with and without tetracycline treatment.

Material and Methods

Fifty farms were included: 40 with reproductive-problems (20 with tetracycline treatment (A), 20 without (B)) and 10 farms without reproductive-problems (C). Total of 770 sows were sampled, (A:333, B:337, C:100). Blood, cervical and rectal swab samples were collected from each sow, additional one dust and one faecal sample from the nursery of each farm. Swabs were analyzed by PCR for Chlamydiaceae and C. suis (Ct<35=positive). Fifty samples were isolated in cell culture and tested for tetracycline susceptibility, including PCR for the tet(C)gene and in-vitro tetracycline resistance screening. Sera were examined for Chlamydiaceae-antibodies by complement-fixation-test. All farmers from study group A and B had the opportunity to send uteri from slaughtered sows with reproductive-problems to researchers. 37 uteri from 18 farms were received and analyzed via PCR and histopathology.

Results

C. suis was detected in rectal swabs from 39 farms (A:92/333;B:109/337;C:38/100) and in samples from nursery of 48 herds (A:19/20; B:19/20; C:10/10). Eight dust samples were positive. Cervical-shedding was rare (six sows from group A+B). Forty-one isolates carried tet(C) (A:15/17; B:23/30; C:3/3). Thirty-nine isolates showed in vitro resistance (A:16/17; B:20/30; C:3/3). Seropositive sows were detected on every farm. All uterus samples were PCR negative; histology mainly indicated cycle-dependent inflammation, epithelial alterations and vascular reactions.

Discussion and Conclusion

C. suis was widespread across all farms, and tetracycline resistance common, irrespective of antimicrobial-use or reproductive-problems. However, cervical-shedding was infrequent, no uterine and oviductal infection was detected, and no association with reproductive-problems identified. Findings indicate high enteric and environmental prevalence of C. suis, but limited evidence for being a primary reproductive pathogen.

REP-OP-05

INCREASED INCIDENCE OF LACTATIONAL OESTRUS DURING WINTER IN A FINNISH SOW FARM: A CASE REPORT

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Background and Objectives

Seasonal infertility in sows is characterized by a reduced proportion of animals returning to oestrus within the expected seven-day weaning-to-oestrus interval, most often during late summer and early autumn. This case report describes an atypical seasonal pattern, marked by a higher-than-expected prevalence of sows failing to return to oestrus during winter rather than the usual warm-season period.

Material and Methods

The Finnish sow farm maintained approximately 2,000 hyper-prolific sows, with a mean litter size of 18.5 for parities 3–6, and an average lactation length of 30 days. The lighting regimen comprised 13 hours in the gestation unit, 15.5 hours in the farrowing and lactation unit, and 17 hours in the insemination unit. Farrowing management, oestrus detection, and insemination management remained unchanged.

Results

During January and February, approximately 18% of sows failed to return to oestrus within seven days after weaning. No significant different in body condition, feed intake, or number of piglets weaned in the affected sows were detected. Ultrasound examination of 20 affected sows showed that 80% had corpora lutea measuring around 10 mm, indicating ovulation one to two weeks earlier, consistent with lactational oestrus. The remaining sows showed abnormal follicular development, resulting in anoestrus, silent oestrus, or follicular cysts. The proportion of sows not returning to oestrus declined to 11% in March–April and returned to normal levels (~5%) from May to November.

Discussion and Conclusion

This report described a seasonal pattern in lactational oestrus characterized by an atypical winter decline in the proportion of sows returning to oestrus after weaning. The underlying mechanism remained unclear but may relate to seasonal changes in prolactin and melatonin levels. Increased melatonin and reduced prolactin during the darker months may decrease milk production, improve energy balance, and promote follicular development during late lactation, facilitating lactational oestrus.

REP-OP-06

PRELIMINARY DATA ON PARTIAL PORCINE OOCYTE IN VIVO MATURATION AND EFFECTS ON BLASTOCYST YIELDS

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Background and Objectives

In vitro embryo production (IVP) in pigs is limited by suboptimal developmental competence of oocytes matured in vitro. Exposure to exogenous hCG prior to ovum pick-up (OPU) may initiate nuclear and cytoplasmic maturation in vivo, enhancing oocyte quality. We evaluated whether partial in vivo maturation induced by hCG improves oocyte competence and embryo development in sows.

Material and Methods

Eight sows received 500 IU hCG intramuscularly 3.5 days post-weaning. OPU was performed 10–14 h (n = 4) or 34–36 h (n = 4) post-hCG. Cumulus–oocyte complexes (COCs) were subjected to different in vitro maturation (IVM) protocols: oocytes collected 10–14 h post-hCG were matured for either 44 h (fully in vitro) or 25 h (partially in vivo), while those collected 34–36 h post-hCG were matured for 3 h (partially in vivo). Fertilization was performed with processed boar semen (1×10^6 motile sperm/mL), and presumptive zygotes were cultured under 6% CO_2 and 7% O_2 to day 5 or 6. Blastocyst yield was recorded as a measure of developmental competence.

Results

Partially in vivo matured oocytes showed higher developmental potential. Blastocyst rates were 6% (2/36) for immature COCs collected 10–14 h post-hCG and matured for 44 h, compared with 33% (7/21) for expanded COCs collected 10–14 h post-hCG and matured for 25 h, and 33% (10/30) for expanded COCs collected 34–36 h post-hCG and matured for 3 h.

Discussion and Conclusion

Partial in vivo maturation before OPU significantly enhanced oocyte developmental competence and blastocyst yield compared with full in vitro maturation. These findings demonstrate that short in vivo exposure to the LH surge prior to aspiration can improve IVP outcomes in pigs. Further testing of this protocol with optimization of follicular synchrony and OPU timing is needed to ensure consistency under field conditions.

RES-OP-01

SEROTYPING OF STREPTOCOCCUS SUIS SYSTEMIC ISOLATES FROM SPANISH PIG FARMS BETWEEN 2019 AND 2025

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Background and Objectives

Streptococcus suis (S. suis) is a major pathogen in swine production and a zoonotic threat. Although serotype (ST) 2 has historically been considered the most prevalent in Europe, recent studies suggest that other serotypes are more common in certain regions, including Spain. This study aimed to analyze the prevalence and distribution of S. suis serotypes in clinical cases from Spanish swine farms.

Material and Methods

A total of 1,003 S. suis isolates collected between 2019 and 2025 from 116 farms were included in this study. Samples were obtained from cerebrospinal and/or synovial fluid of animals showing clinical signs compatible with meningitis and/or arthritis. Identification of S. suis isolates was performed using Matrix-Assisted Laser Desorption/Ionization–Time of Flight (MALDI-TOF) mass spectrometry. Serotyping was carried out using an in-house multiplex PCR assay.

Results

The distribution of ST revealed that ST9 (n=246) was the most prevalent, followed by ST1 (n=174), ST7 (n=162), ST1-14 (n=112), ST2-1/2 (n=108), and ST2 (n=88). It should be noted that the same serotype could be detected multiple times on the same farm during the study period. The average number of STs detected per farm during the study period was 2.28 (range 1–7).

Discussion and Conclusion

The present study provides an updated overview of S. suis serotypes circulating in Spanish swine farms, revealing ST9 as the most prevalent, while ST2 accounted for only 8.8% of clinical cases. Diagnostic precision before 2022 was limited since PCR techniques did not distinguish between serotypes 2–1/2 and 1–14, potentially leading to their underestimation. The lack of cross-protection among serotypes continues to complicate disease prevention, underscoring the need for ongoing surveillance to better understand S. suis epidemiology and to design more effective prevention and control strategies.

RES-OP-02

THE PORCINE CAROTID BODY: FIRST COMPREHENSIVE MORPHOLOGICAL, IMMUNOHISTOCHEMICAL, AND LECTIN-HISTOCHEMICAL CHARACTERIZATION

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Background and Objectives

The carotid body (CB) is a key peripheral chemoreceptor with neuroendocrine and glial features, but its structure in pigs remains poorly documented despite the species' growing relevance as a translational biomedical model. Existing literature contains detailed descriptions for rodents, primates, and humans, yet no integrative morphological or histochemical characterization of the porcine CB has been reported. This study aimed to provide the first comprehensive analysis of the pig CB, combining classical histology, immunohistochemistry, and lectin histochemistry to define its cellular composition and glycan-related receptor architecture.

Material and Methods

Sixteen piglets (4–8 weeks) were examined, of which four yielded complete bilateral CBs due to the organ's minute size and deep location. Samples were collected at the carotid bifurcation, fixed in buffered formalin, processed for routine histology (H&E, Masson's trichrome), and evaluated by immunohistochemistry using GFAP, S100, and NSE. Lectin histochemistry with Concanavalin-A (Con-A) and Sambucus nigra agglutinin (SNA) was performed to map glycosylation patterns relevant to neurotrophic receptors (TrkA/B/C, p75NTR). Fluorescence imaging was conducted using confocal microscopy

Results

The porcine CB displayed the expected multilobular organization with compact glomerular clusters separated by fine connective septa. Type I (glomus) cells were centrally positioned with dense cytoplasmic granules, whereas Type II (sustentacular) cells formed a peripheral glial-like network. NSE showed strong diffuse staining in glomus cells (H-score 205), S100 labeled sustentacular cells (H-score 175), and GFAP showed weaker but consistent glial positivity (H-score 130). Con-A produced intense perinuclear and cytoplasmic labeling, consistent with mannose/glucose-rich N-glycans, while SNA highlighted sialylated membrane domains associated with neurotrophin receptors.

Discussion and Conclusion

This study delivers the first multimodal morphological, immunohistochemical, and lectin-histochemical characterization of the porcine CB. The combined neuroendocrine, glial, and glycan-receptor signatures closely parallel those reported in other mammals, reinforcing the pig as a relevant translational model for chemosensory physiology, neuroregeneration, and dopaminergic cell-based therapeutic research.

RES-OP-03

FIRST EXPERIMENTAL INFECTION WITH THE RECENTLY DESCRIBED HAEMOTROPHIC MYCOPLASMA SPECIES CANDIDATUS (CA.) MYCOPLASMA (M.) HAEMOSUIS IN SPLENECTOMISED PIGS

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Background and Objectives

Ca. M. haemosuis has recently been identified as a haemotrophic agent in pigs. Still, its clinical relevance and pathogenic potential remain unclear, especially when compared with the well-characterised M. suis. A prevalence study from Germany demonstrated the widespread distribution across pig herds, but controlled infection trials are lacking to date. This study aimed to determine the organism's ability to induce clinical signs in a standardised experimental setting.

Material and Methods

Six splenectomised female pigs (~ 11 kg) were inoculated 8–12 days post-splenectomy by intravenous administration of either 10^6 or 10^8 bacteria/mL blood (n = 3 per dose). Clinical examinations were performed twice daily using a predefined scoring system. Blood samples were collected every 2 days until day 10 p.i. and thereafter at 7-day intervals; additional samples were obtained whenever clinical abnormalities were observed. Each sampling included complete blood count analysis and quantitative real-time PCR. Tetracycline treatment was initiated when animals reached predefined clinical thresholds, which occurred in all pigs on day 5 p.i.

Results

All pigs developed acute clinical disease by day 5 p.i., characterized by fever and petechial haemorrhages, predominantly perianally. Two pigs additionally showed mild neurological signs. Peak clinical disease coincided with maximum bacteraemia (Ct values 11.5-13.1). Following the initiation of antimicrobial treatment, clinical signs improved markedly within 24 hours. However, low-level PCR positivity (Ct 30–33) persisted until at least 24–38 days p.i., and the study is ongoing. No clear differences between inoculation doses were observed.

Discussion and Conclusion

This study demonstrates that Ca. M. haemosuis can induce an acute and consistent clinical syndrome in experimentally infected pigs, comparable to that described for M. suis, providing useful reference data for the interpretation of infections with this haemotrophic agent. Further investigations, also in immunocompetent pigs and under natural exposure conditions, are needed to understand its pathogenic role.

RES-OP-04

DIFFERENT FEEDING CURVES IN PRIMIPAROUS SOWS AT THE END OF GESTATION AND THEIR INFLUENCE ON THE AVERAGE WEIGHT OF PIGLETS AT BIRTH, LITTER WEIGHT, INTRA-LITTER VARIATION AND THE PERCENTAGE OF PIGLETS WEIGHING LESS THAN 800 GRAMS

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Background and Objectives

Increasing feed intake during the last third of gestation is common, with the aim of influencing the weight of piglets at birth. Although some studies claim to refute this, our objective was to examine the influence of feeding different amounts and types of feed to primiparous sows and its influence on average weight, litter weight, intra-litter weight dispersion and the percentage of piglets weighing less than 800 g.

Material and Methods

A total of 64 primiparous sows were divided into 5 groups and fed differently from day 85 of gestation to day 110. All piglets born were then weighed individually. Group 1 (G1) ate 2.4 kg/day of gestation feed (NE 5,400 kcal and 13 g DLys), Group 2 (G2) ate 2.9 kg/day of gestation feed (NE 6,525 kcal and 15.7 DLys), Group 3 (G3) ate 3.5 kg/day of gestation feed (NE 7,875 kcal and 19 g DLys), Group 4 (G4) ate 2.4 kg/day of transition feed (NE 5,616 kcal and 16.8 g DLys), and Group 5 (G5) ate 2.9 kg/day of transition feed (NE 6,786 kcal and 20.3 g DLys).

Results

With no significant differences in litter size, there were also no differences between the groups in terms of average piglet birth weight, litter weight or intra-litter weight ($p>0.05$). However, a difference ($p<0.001$) was observed between the groups in terms of piglets weighing less than 800 g: G1 2.6%, G2 2.2%, G3 9.8%, G4 2.7% and G5 6%.

Discussion and Conclusion

With these results, it appears that diets with higher NE and DLys values (G3 and G5) were detrimental, as they increased the percentage of piglets weighing less than 800 g. Primiparous sows are a group with different needs, and more specific studies are needed in this group of animals.

VPH-OP-01

ANTIMICROBIAL RESISTANCE PATTERNS IN ITALIAN PIG PRODUCTION: MULTIDRUG AND CRITICAL RESISTANCE IN THREE KEY PATHOGENS

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Background and Objectives

The spread of antimicrobial resistance (AMR) in pig production poses a critical One Health threat. Italy is a large pig producer in Europe, with generally high AMR rates. This study reports AMR patterns for three major pig pathogens (Escherichia coli, Pasteurella multocida and Streptococcus suis) in Italian pig farms, focusing on multidrug resistance (MDR) and WHO highest priority critically important antimicrobials (HPCIAs).

Material and Methods

A total of 3,101 E. coli, 612 P. multocida and 478 S. suis clinical strains, isolated by the Brescia diagnostic laboratory of IZSLER between 2022 and 2024, were tested via microplate broth microdilution to determine minimum inhibitory concentrations (MICs).

Results

The MDR rate was 92.0% in E. coli, 24.7% in P. multocida and 80.8% in S. suis, with significant differences among pathogens (Chi-square test: $p < 0.001$; Cramér's $V = 0.598$). MDR remained stable over time in E. coli (87.2% in 2022 vs. 89.9% in 2024), while increasing in P. multocida (19.8% vs. 27.0%) and S. suis (58.1% vs. 89.6%). Resistance to HPCIAs varied significantly among pathogens: resistance to third-generation cephalosporins was 15.3% in E. coli, 0.2% in P. multocida and 3.3% in S. suis ($p < 0.001$; V 0.189), while quinolone resistance reached 52.5%, 4.1% and 7.7%, respectively ($p < 0.001$; V 0.437). Polymyxin resistance was only evaluated in E. coli (8.4%). The highest resistance rates were observed for aminopenicillins in E. coli (91.1%) and tetracyclines in P. multocida (54.1%) and S. suis (97.7%).

Discussion and Conclusion

Although these data should be interpreted with caution as they derive from routine diagnostic activities, the observed MDR and HPCIAs resistance rates are concerning. Despite ongoing efforts to decrease and rationalise antimicrobial use in Italian pig farming, reducing MDR and preserving the efficacy of some antimicrobial classes remains a major challenge. Continuous surveillance and tailored antimicrobial stewardship are pivotal in mitigating the spread of AMR.

VPH-OP-02

REDUCED ANTIBIOTIC USE FOR TREATMENT OF DIARRHEA IN NURSERY PIGS

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Background and Objectives

Batch medication of diarrhea outbreaks is the main driver of antibiotic use in Danish pig production. In 2024 an average pig received 6.5 days of oral antibiotic medication during the nursery period. The purpose of this study was to reduce antibiotic use by application of individual animal treatment and refined criteria for treatment of diarrhea in nursery pigs.

Material and Methods

The study was conducted on a farm suffering from diarrhea outbreaks caused by ETEC F4 and subsequently Brachyspira pilosicoli and Lawsonia intracellularis. In each of 137 separate nursery pens an indicator pig was selected and followed from insertion at weaning to planned exit. All incator pigs were clinically evaluated daily, and average daily gain (ADG) were recorded.Pigs with treatment-requiring diarrhea received antibiotics parenterally for three days if two criteria were met simultaneously: 1) diarrhea (back-part staining/diarrheic feces) AND 2) clinical complications: Depression, dehydration, sunken flanks, ill-thrift. Pigs with diarrhea but no clinical complications were left untreated.

Results

A total of 41 pigs (30%) developed treatment-requiring diarrhea, while 80 pigs (58%) developed uncomplicated diarrhea, and 16 pigs (12%) were without diarrhea. The average daily diarrhea prevalence was 10% and the average daily treatment prevalence was 0.8%. Pigs with uncomplicated diarrhea (average 2.9 diarrhea days) recovered well without antibiotic treatment. Pigs with treatment-requiring diarrhea had longer diarrhea periods (average 8.0 diarrhea days) in spite of treatment. The ADG in pigs with treatment-requiring diarrhea (485 g/day) was significantly ($p<0.05$) reduced compared to pigs without diarrhea (549 g/day). The ADG in pigs with uncomplicated diarrhea (514 g/day) did not differ significantly from pigs without diarrhea.

Discussion and Conclusion

The study showed that uncomplicated diarrhea cases did not require antibiotic treatment and had growth rates similar to pigs without diarrhea. In conclusion individual animal treatment and refined treatment criteria reduced the number of diarrhea treated animals by 70% compared to batch medication.

VPH-OP-03

DETECTION AND SUBTYPING OF BLASTOCYSTIS SPP. BY METABARCODING ANALYSIS IN ITALIAN PIGS

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Background and Objectives

Blastocystis sp. is among the most common enteric protists in humans and animals; however, its occurrence, subtype distribution, and role within the gut microbiota remain poorly understood. Although it is often considered a commensal organism, several studies in pigs have reported its occurrence in association with gastrointestinal symptoms, suggesting a potential, yet still debated, role in enteric disorders. This study investigated its prevalence, subtype diversity, and associations with gut microbial communities in Italian pigs.

Material and Methods

A total of 128 faecal samples from 22 fattening pig farms (northern Italy) were analysed using a quantitative copromicroscopic examination and amplicon-based next-generation sequencing (NGS) metabarcoding approach.

Results

All samples tested positive, exhibiting either single or mixed infections involving five subtypes (ST1, ST2, ST3, ST5, and ST15). ST5, considered pig-specific, was the most prevalent (78.9%), followed by ST1 (75.0%) and ST3 (45.3%), whereas ST2 and ST15 were less frequent. Age significantly influenced microbial ⟨-diversity and subtype carriage: older pigs showed higher richness and were predominantly colonized by ST5. Nematodes, more prevalent in older pigs, were often detected alongside ST5, suggesting potential interactions between helminths and Blastocystis sp. in modulating gut microbiota. Bacterial composition also varied according to age and subtype. In particular, older pigs exhibited higher relative abundance of Alloprevotella spp., Prevotella spp., and Faecalibacterium spp., while younger animals showed a more heterogeneous microbial profile.

Discussion and Conclusion

This is the first comprehensive assessment of Blastocystis sp. in pigs raised in northern Italy, revealing high prevalence, frequent mixed infections, and subtype-specific associations with the gut microbiota. These findings provide a foundation for future research on Blastocystis sp., aimed at elucidating its pathogenicity, zoonotic potential, and the origins of the subtypes detected in pigs, and highlight the utility of advanced molecular techniques for resolving intra-host subtype diversity and exploring interactions between the parasite and the gut microbial community.

VPH-OP-04

GENETIC CHARACTERIZATION OF SWINE INFLUENZA A VIRUSES IN POLISH MULTI-SITE PRODUCTION SYSTEMS

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Background and Objectives

Swine influenza A virus (swIAV) is a major pathogen in pig production, causing respiratory disease, economic losses, and posing a zoonotic threat. Pigs act as “mixing vessels” for influenza viruses, enabling reassortment between avian, human, and swine strains, which can lead to novel variants with pandemic potential. Understanding the genetic diversity and transmission dynamics of swIAV within production systems is essential for effective control.

Material and Methods

This investigation was conducted in a large multi-site production organization comprising several sow farms with more than 1,000 sows each. Routine regulatory monitoring was performed by nasal swabs, and samples with Ct values below 25 were submitted for next-generation sequencing (NGS) to characterize circulating strains. Pig flow between sow and nursery sites was documented to assess potential transmission pathways.

Results

A total of 17 sequences were generated from samples collected in 2024–2025. Sequencing revealed that H1avN2 (clade 1C.2.5) was the predominant subtype, alongside human-like H3N2 strains. Additional Subtypes belonging to Clade 1C.2.2 were present. Internal genes from the pandemic H1N1 lineage (pdm09) were widespread, indicating frequent reassortment. Genotype T (Watson et al. 2015) dominated across sites, but new genotypes and reassortants emerged, particularly in downstream nursery farms receiving pigs from positive sow farms. Particular nurseries with different origins showed novel genotype patterns, suggesting ongoing viral evolution. Evidence of human-origin H3N2 introductions highlights the role of human-to-pig transmission.

Discussion and Conclusion

The high number of pandemic internal genes and reassortment events underscores the zoonotic risk and the urgent need for strict control measures. These include comprehensive sow vaccination, improved pig flow management, and enhanced biosecurity protocols. Vaccination of farm workers against seasonal influenza and the use of masks for individuals with flu-like symptoms should be considered to minimize human introductions. Continuous molecular surveillance remains critical for early detection and prevention of novel strain emergence.

VPH-OP-05

REVERSE ZOONOTIC INFLUENZA INTO PIG FARMS: EVIDENCE OF CO-CIRCULATIONS OF HUMAN- AND SWINE-ORIGIN VIRUSES IN WINTER 2025

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Background and Objectives

Influenza A viruses (IAVs) are highly contagious, and transmission between pigs and humans occurs frequently in both directions. Here, we report cases of reverse zoonosis in production farms during the human influenza season in early 2025.

Material and Methods

Case 1: Passive surveillance was conducted in a farrow-to-finish herd (herd 1) by swabbing pigs at 12, 6 and 8 weeks of age on 5 December 2024, 29 January 2025 and 11 February 2025, respectively, as well as sows on 29 January 2025. Case 2: Nine gestating sows and three sows in maternity rooms from another farrow-to-finish herd (herd 2) were sampled through tracheobronchial or nasal swabs during respiratory outbreaks on 23 and 27 January, respectively. Samples were tested for IAV by M-gene RT-qPCR. Virus strains were genotyped through whole-genome sequencing and phylogenetic analyses performed using Nextclade.

Results

Two distinct viruses were identified in herd 1. An avian-like swine $H1_{av}N1$ virus infected all growing pigs at the three sampling points. A human-origin $H1_{pdm}N1_{pdm}$ virus (HA clade 6B.1A.5a.2a) was detected alongside $H1_{av}N1$ in 6-week-old piglets in January, as well as in sows. Similarly in herd 2, two human-origin viruses, H3N2 (HA clade H3.2020) and $H1_{pdm}N1_{pdm}$, were detected in gestating and maternity sows, respectively.

Discussion and Conclusion

Analyses indicate human-origin virus introductions, likely resulting from contact with the farmer of herd 1, who was confirmed to be infected with IAV in January 2025. In herd 2, where no clinical signs were reported in humans, transmission from a contaminated environment could have occur, as the farm is open to the public for direct sales. Theses instances of viral co-circulation, and even co-infection, increase the risk of generating novel viruses with unpredictable zoonotic potential and underscore the importance of strict biosecurity measures for anyone working with animals or entering farm premises while experiencing flu-like symptoms.

VPH-OP-06

EVALUATION OF ORAL FLUID SWAB SAMPLING FOR INFLUENZA A VIRUS SURVEILLANCE IN OUTDOOR-FARMED PIGS

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Background and Objectives

Pigs raised outdoor are at higher risk of contact with avian influenza infected wild birds. Systems where pigs are raised permanently outdoor, include nature-inclusive farming systems or farms with public functions. Systematic influenza A virus (IAV) surveillance in these farming systems is however often lacking. Moreover, as animal fixation in these farming systems is challenging, non-invasive sample methods would contribute to feasibility and higher acceptance by these farmers.
The aim was the assessment of the diagnostic performance of oral fluid swab (OS) and nasal swab (NS) for the detection of IAV, and monitoring of IAV in outdoor raised pigs using OS.

Material and Methods

For testing the diagnostic performance of OS and NS without concurrently running a gold standard test, a Bayesian Latent Class analysis (BLCA) was performed using 72 individual OS and NS samples from pigs coming from three conventional farms as part of the project MOEDIG: RAAK.PRO05.009. RNA was isolated and analysed with a rt-qPCR for the presence of IAV. For the surveillance of IAV in outdoor pig farms (n=21), 192 individual and group OS were collected in 2024-2025 as part of the HADEA project Strong1H. Samples were tested with a rt-qPCR for the presence of IAV.

Results

The BLCA estimated a diagnostic sensitivity and specificity of 0.91 (0.73-0.99) and 0.98 (0.91-1) for OS, and 0.97 (0.85-1) and 0.91 (0.78-0.98) for NS, respectively. IAV was not detected in any sample of the outdoor pigs monitored.

Discussion and Conclusion

OS can offer an alternative to NS for IAV detection in these production systems. Although OS showed a lower sensitivity than NS, it was considered acceptable to be used in these farming systems, as a high proportion of the herd is sampled. OS sampling was easy to perform and it was well accepted by farmers.

VVD-OP-01

ATYPICAL PORCINE PESTIVIRUS INDUCED CONGENITAL TREMOR: CLINICAL COURSE AND CNS PATHOLOGY

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Background and Objectives

Atypical porcine pestivirus (APPV) is the causative agent of congenital tremor (CT) type A-II in piglets. Although clinical features have been outlined, detailed characterization of neurological signs over time and their association with neuropathological changes is limited. Understanding this is important to clarify disease mechanisms and shape management strategies. This cohort study aimed to (1) systematically document clinical and neurological signs of APPV-induced CT throughout the pigs' lifespan and (2) characterize pathology in the central nervous system (CNS) in the same pigs.

Material and Methods

Sixty-four pigs were followed from birth to slaughter, including 37 from CT-litters and 27 from healthy control litters. Clinical examinations were performed at five time points, with detailed scoring of tremor characteristics. A subset of 15 pigs with initial severe tremor were euthanized at approximately three days, three weeks, and four months for neuropathological investigation. RT-qPCR, histology, immunohistochemistry and transmission electron microscopy assessed viral presence and CNS lesions.

Results

Tremors were consistent with intention tremor and improved over time. Impaired mobility, hypermetria and arthritis were associated with severe tremor, while ataxia, splay leg and cranial nerve deficits were not observed. Tremor persisted beyond weaning in 60% of affected pigs and until slaughter in 40%. Pathological examinations revealed cerebellar and spinal white-matter vacuolization and cerebellar hypomyelination in newborns and three-week-olds, normalizing by four months. Older pigs showed mild, focal microgliosis, without leukocyte infiltration, despite APPV being detected in CNS at all ages.

Discussion and Conclusion

This indicates that APPV-induced CT results from transient disruption of myelination and vacuolization in the CNS, with clinical recovery parallelling remyelination. Intention tremor and hypermetria align with cerebellar pathology, linking clinical signs to observed lesions. APPV persisted in the CNS, raising questions about immunity. These findings enhance understanding of APPV pathogenesis and underline welfare concerns and the need for improved diagnostic and management strategies.

VVD-OP-02

ASSESSMENT OF THE AIRBORNE TRANSMISSION OF THE HIGHLY VIRULENT PRRSV-1 STRAIN "ROSALIA"

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Background and Objectives

Porcine reproductive and respiratory syndrome (PRRS) remains one of the most economically important diseases in pig production worldwide. Its virus (PRRSV) spreads through multiple direct and indirect routes, including vertical and nose-to-nose transmission, contaminated semen, fomites or personnel. While airborne spread of PRRSV-2 is well established, little is known about the airborne transmissibility of PRRSV-1. This study aimed to determine, under controlled experimental conditions, whether a virulent PRRSV-1 strain can be airborne transmitted.

Material and Methods

Eighteen PRRSV-free pigs were assigned to three groups: six pigs intranasally inoculated with the PRRSV-1 "Rosalia" strain (INOC), six pigs housed in the same room but without direct contact (INDIR CONT), and six pigs placed in a separate room receiving the outgoing airflow from the inoculated room (AIR CONT). Inoculated pigs were sampled regularly via blood and nasal swabs, whereas pigs in the other groups were only blood sampled. Bioaerosol were collected throughout the study at the air inlet of the AIR CONT room and at the interface between INOC and INDIR CONT groups. All samples were tested by RT-PCR for PRRSV genome detection.

Results

Viremia in the INOC pigs appeared from 2 days post-inoculation (dpi) until 42 dpi, with nasal shedding observed from 2 to 21 dpi. In the AIR CONT group, two pigs became viremic at 7 dpi and all were infected by 10 dpi, indicating efficient airborne transmission. In the INDIR CONT group, PRRSV transmission was delayed with the first viremic pig detected at 10 dpi, but the last one getting infected at 42 dpi. Bioaerosol analyses confirmed the presence of PRRSV genome in both rooms, at almost all the sampling points.

Discussion and Conclusion

These results provide the first experimental evidence that a highly virulent PRRSV-1 strain can be airborne transmitted. Additional studies are ongoing to evaluate the airborne transmission potential of low-virulent and vaccine-derived PRRSV-1 strains.

VVD-OP-03

EVALUATION OF DOSE-DEPENDENT VIRULENCE OF PRRSV-1 "ROSALÍA" IN WEANED PIGLETS AND THE MODULATING ROLE OF MATERNAL ANTIBODIES

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Background and Objectives

The highly virulent PRRSV-1 Rosalía strain has caused unprecedented clinical impact in Spain since 2020, highlighting the need for robust challenge models to assess vaccine efficacy. Determining how different challenge doses interact with pre-existing maternal antibodies is particularly relevant in weaned piglets, as maternally derived immunity can substantially shape early infection dynamics. This study evaluated three intranasal challenge doses of PRRSV-1 Rosalía and examined the extent to which maternal antibodies modulate viral replication, clinical expression, and pathological outcomes.

Material and Methods

Twenty-seven piglets were assigned to three infected groups (10^4, 10^5, or 10^6 $TCID_{50}$) and one control group. Pre-challenge ELISA status (maternal antibody–positive vs. negative) was used as a stratifying variable. Animals were monitored for 14 days for clinical signs, temperature, growth, viremia, nasal shedding, seroconversion, and lung pathology. Viral RNA was quantified via qPCR; antibodies were measured using IDEXX PRRS X3 ELISA.

Results

All challenge doses established infection, with serum viral loads peaking at day 7. Differences between challenge doses were modest; however, maternal antibody status produced consistent and biologically meaningful contrasts. Antibody-negative piglets showed lower Ct values (higher viral load) at peak viremia—particularly in the 10^6 $TCID_{50}$ group—and exhibited accelerated seroconversion kinetics. Clinical expression was also modulated by maternal immunity: although fever patterns were similar, growth suppression was markedly greater in antibody-negative animals, again most evident under high-dose challenge. Lung-to-body weight ratios and histopathology confirmed a dose-dependent inflammatory response, but maternal antibody–positive pigs consistently showed milder lesions.

Discussion and Conclusion

Maternal antibodies significantly modulate infection outcomes under PRRSV-1 Rosalía challenge, reducing viral load, lung inflammation, and growth loss. High-dose challenge (10^6 $TCID_{50}$) most reliably differentiates immune-status groups and is recommended for PRRSV vaccine efficacy studies in weaned piglets.

VVD-OP-04

VVD – VIRAL DISEASES

ASSESSING THE ROLE OF GILT-RELATED RISK FACTORS FOR PRRSV TIME-TO-LOW-PREVALENCE

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Background and Objectives

Elimination of porcine reproductive and respiratory syndrome (PRRS) has become increasingly challenging. Age at PRRSV exposure may influence infection duration and transmission, as younger pigs experience longer viremia and higher viral loads in pulmonary macrophages compared to older pigs. Questions regarding the impact of gilt age at exposure on elimination success arise. The objectives of this study were to evaluate the post-LVI infection dynamics across gilt age groups and to evaluate the effect of gilt age on the probability of producing PRRSV-negative litters.

Material and Methods

A study was conducted on a 2,500-head category 1A L1C.5.36 PRRS-infected sow farm that allowed entry of gilts of varying ages at closure. Two-to six-month-old gilt cohorts were longitudinally sampled following the initial LVI event. Oral fluids were collected at approximately 1, 3, 7, 11, and 16 weeks post-LVI. Tonsil-oral scrubbing (TOSc) samples were collected from 15 gilts at various gestational stages and prior to farrowing. Aggregated processing fluids were collected weekly from gilt and P2+ litters. Samples were tested by PRRSV RT-PCR. Time-to-PRRSV-negative post-LVI by gilt age was evaluated using Kaplan-Meier survival analysis and Cox proportional hazard models, with descriptive analyses used to assess litter PRRSV status.

Results

Time-to-PRRSV negative status varied by gilt age ($p = 0.035$). Notably, 4-month-old gilts were more likely to clear the virus sooner than 2-month-old gilts ($p = 0.022$; HR = 7.03). There was no difference in the positivity rate of PRRSV-negative litters from gilts and periparturient sows.

Discussion and Conclusion

Results from this study indicate that gilt age at the time of PRRSV exposure influences the rate of clearance, though it may not impact farrowing litter status. Findings suggest that younger gilts may require a longer cooling-off period post-exposure, without negatively affecting litter status. Further research across multiple farms and PRRSV strains is warranted to expand upon findings.

VVD-OP-05

VVD – VIRAL DISEASES

MULTI FARM OUTBREAK OF EXOPHTHALMOS, ERYTHEMA AND ALOPECIA IN PIGLETS, A NOVEL CLINICAL SYNDROME ASSOCIATED WITH A NOVEL VARIANT OF PARVOVIRUS

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Background and Objectives

In 2025, Royal GD, received reports of an unknown syndrome in suckling and weaning piglets, characterised by exophthalmos, bilateral strabismus, generalised erythema and alopecia, peaking to 80% of pigs in 50% of litters. Although mortality is not reported, farms report growth retardation. In October 2025 >80 Dutch farms have reported cases.

Material and Methods

Extensive post-mortem (PM) investigations of submissions from ten farms with similar clinical problems were performed. Clinical chemical and laboratory analyses were conducted to investigate potential nutritional, toxicological or infectious causes. Telephone surveys were conducted to explore potential risk factors between farms. Finally, Virus Discovery using Oxford Nanopore Technologies (ONT) sequencing was used to detect an infectious cause.

Results

PM resulted in absence of clear and consistent lesions in organs and eyes. Initial hypotheses for nutritional and toxicological causes were rejected. Common risk factors could not be identified. ONT sequencing resulted in detection of large quantities of full protoparvovirus genomes in multiple organ samples (liver, kidney, eyes and serum) with high similarity to a parvovirus previously found in fox faeces in 2012. A PCR test specific for this parvovirus showed high amounts of viral DNA in affected pigs and absence of viral DNA in healthy controls. In situ hybridisation indicated virus transcription in at least liver and kidney tissues but not in eyes, previously testing PCR+.

Discussion and Conclusion

We conclude that the parvovirus variant is associated to the observed clinical signs, but the exact pathophysiological mechanism remains to be elucidated. Farms report initial outbreaks to last ~4 months, but long term follow up is needed. The origin of the introduction to pig farms and modes of between farm transmission are yet not identified. This study exemplifies the value of syndromic surveillance combined with structured clinical and laboratory investigations to advance and safeguard animal health.

VVD-OP-06

VVD – VIRAL DISEASES

PCV3 IN ABORTED AND STILLBORN PIGLETS

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Background and Objectives

Although porcine circovirus type 3 (PCV3) is associated with reproductive failure in swine, its clinical impact is poorly understood. This study aimed to further characterize PCV3-associated reproductive failure by integrating literature review, clinical observations, and diagnostic results.

Material and Methods

We reviewed literature to evaluate known pathogenetic and diagnostic characteristics of PCV3 infection in reproductive failure. Thirteen cases from nine farms were included involving aborted or stillborn piglets submitted to Royal GD (The Netherlands) between April 2022 and May 2025. Cases were included based on presence of microscopic lesions in combination with detection of PCV3 through PCR or in situ hybridization (ISH). We integrated diagnostic results including histopathology, PCR, and in situ hybridization (ISH) to evaluate the role of PCV3 in reproductive failure.

Results

In previous publications, PCV3 infection is associated with multisystemic perivascular inflammation and presence of virus in various organs including the central nervous system, kidneys, heart, and lungs. In our study, PCV3 was the sole pathogen identified in 12/13 cases. (Peri)vascular mononuclear inflammation was found in all cases, in various fetal tissues. PCV3 DNA was most frequently detected by ISH in myocardial tissue, followed by central nervous system tissues.

Discussion and Conclusion

We found PCV3 in characteristic lesions, supporting a pathogenic role of this virus. The number of cases in our study is still limited. Until recently, PCV3 was not routinely investigated in case of reproductive failure, therefore underreporting is likely. (Peri)-vascular inflammation is not specific for PCV3 infection, and PCV3 can also be detected in healthy pigs. PCR results should therefore be interpreted within the context of other diagnostic results.

Viral load, positive ISH, and presence of tissue lesions support a significant pathogenic role of PCV3 in reproductive failure. Further research is needed to clarify tissue tropism, define clinical relevance, and risk factors for PCV3 associated disease.

WEL-OP-01

EVALUATION OF INTRAMUSCULAR INJECTION SITES IN GERMAN SOW FARMS

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Background and Objectives

The parenteral administration of drugs and vaccines by intramuscular injection is a method in pigs that holds a prominent position due to its advantages of targeted, individualized treatment. The number of injections in German sow farms has increased significantly over the past 15 years, performed by veterinarians, but more frequently by farm staff. These practices are generally only questioned when obvious problems arise (e.g. high number of injuries or inflammations, unexplained sow losses after treatment, too frequent injections into the subcutaneous or fatty tissue). This evaluation aims to gain insights into the practice of intramuscular injections in German sow farms.

Material and Methods

In 10 German sow farms (100-1500 sows, farm staffs 2-7) vaccination procedures of the farm staff were documented by the same vet. The injection sites of the neck were systematically scored (each farm 54-132 sows) by a scheme according to good veterinary practice (“acceptable”, “too far cranial/ caudal, ventral/ dorsal”) and a questionnaire was performed.

Results

The average percentage of successful injections (acceptable) across all farms was 54.4% (46.1-80.0%). The highest percentage of suboptimal injection sites, 31.1% (17.0-40.2%) was too far caudal towards the shoulder joint. 5.06 (2.11-7.84%) were judged to be too far up, 5.87% (0.00-11.8%) % too far down and 3.54% (0.00-7.37%) too far forward.

Discussion and Conclusion

Intramuscular administration remains one of the most important tools for vaccinations and treatments of sows. We consider reducing injuries to sensitive anatomical structures (vessels, nerves, lymph nodes) and improving suboptimal vaccine and treatment efficacy as relevant aspects for improving sow health. As a result of this study, we identify practical opportunities for optimizing intramuscular injection sites in sows. To improve the results obtained, monitoring and training materials for farm personnel have been developed.

WEL-OP-02

EFFECTS OF CLAW TRIMMING IN BREEDING SOWS ON CLAW HEALTH, LAMENESS, AND PERFORMANCE PARAMETERS

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Background and Objectives

Healthy claws are of great importance for welfare, especially in group-housed sows. This study assessed the benefits of claw trimming measures in sows for improving claw health, reducing lameness, and improve economic benefits.

Material and Methods

Claw lesions were recorded and trimming measures were performed in 134 sows housed on slatted floors without bedding material ten days after weaning. Lameness scores were recorded immediately before and after claw trimming, as well as two and six weeks later. Claw lesions were re-evaluated after six weeks.

Results

Claw lesions were detected in all sows; 27% of the sows showed lameness. Claw trimming lasted a median of seven minutes per sow. Overgrown main (from 41.03% to 5.13%) and dew (from 86.32% to 14.53%) claws, dew claw injuries (from 23.93% to 6.84%), defects of the sole (from 34.19% to 8.55%), heel horn to sole junctions (from 53.85% to 15.38%) and white line defects (from 73.50% to 52.14%) decreased after claw trimming, but the prevalence of severe claw lesions (scores 3 and 4) didn't change over time. The overall claw lesion scores and the scores for overgrown main claws were correlated with the lameness score. In lame sows claw trimming had the best effect, but the prevalence of lame sows remained unchanged. The return-to-estrus rate increased from 7 to 15% in the production cycle with claw trimming. Claw trimming had neither an effect on live-born, crushed or weaned piglets nor on piglet losses.

Discussion and Conclusion

Claw trimming can improve claw health and locomotion score in lame sows. It cannot be recommended as a routine measure in all sows. Claw trimming ten days after weaning cannot be recommended because the return-to-estrus rate increased. It should be performed in the farrowing pen while lying as a therapeutic measure. It should be accompanied by a comprehensive management concept for improving claw health.

WEL-OP-03

A NOVEL SEMI-QUANTITATIVE EATER SCORING SYSTEM USING CREEP FEED VISITS AND SCAN SAMPLING TO PREDICT POST-WEANING INTAKE

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Background and Objectives

Traditionally, classification of creep feed eaters relies on in-feed colorants and remains qualitative. Behavioural scan sampling may act as semi-quantitative alternative. Piglets kept in social intermittent suckling (SIS) environment provides an ideal framework to test an eater-score scan sampling (ES). This study aimed to validate a novel ES method in piglets reared under conventional weaning (CW) and SIS management.

Material and Methods

Thirty-five litters (12-14 piglets each) were assigned to CW (n = 17) or SIS (n = 18). SIS involved daily sow removal gradually increasing from 4h to 10h/day during the last 10 days prior to weaning (d24), plus voluntary socialization between adjacent farrowing pens. Creep feed was offered ad libitum and feeders were removed and refilled four times/day. A scan sampling protocol was followed on days -3 and -2 to weaning by noting down piglets eating at every 5 minutes for a 30-minute interval after the feeder was placed in the pen. The resulting eater score is the sum of feeding events. Mixed models were used to evaluate factors influencing eater score and individual post-weaning performance.

Results

Three feeding moments were sufficient to consistently identify feeding behaviour resulting in cumulative score ≥4 as the eater threshold (244 non-eaters and 240 eaters). The SIS had more eaters (35 vs. 14%) and higher score (6.4 vs. 2.8) than CW ($P < 0.001$). In CW, larger litters and primiparous sows favoured eaters. In SIS, more eaters were detected with larger litters, heavier birth weight, and lower pre-weaning growth. For post-weaning piglets (n = 144), ES predicted feed intake and growth during the first three (R^2 = 0.35 and 0.23) and seven days (R^2 = 0.24 and 0.21).

Discussion and Conclusion

In conclusion, ES effectively identified pre-weaning feeding behaviour and correlated with post-weaning feed intake and growth. SIS increased creep eating and post-weaning adaptation.

WEL-OP-04

TO CONFINE OR NOT TO CONFINE

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Background and Objectives

Farrowing crates are widely used for sows on commercial farms although they have a negative impact on welfare. The aim was to investigate the effects of different farrowing strategies on piglet mortality, litter growth, farrowing duration, and average piglet birth interval.

Material and Methods

The study consisted of three farrowing treatments on two farms: FF (free farrowing), TC0int:3 (free during nest-building period but crated when farrowing started, and for three days) and TC2:3 (crated from 2 days before expected farrowing until 3 days after farrowing). On farm 1, sows were allocated to all three treatments: FF (n=39), TC0int:3 (n=34) and TC2:3 (n=36). On farm 2, sows were allocated two treatments: FF (n=24) and TC0int:3 (n=23).

Results

Farrowing treatment tended to affect the number of stillborn piglets on farm 1 (Kruskal-Wallis test, p=0.09). The median of stillborn piglets in FF was 0(range 0 – 4), in TC0int:3 1(0 – 6) and in TC2:3 0(0 – 4). Mortality did not differ between the farrowing treatments on farm 2.
On farm 1, no difference was found between the farrowing treatments on litter growth. On farm 2, TC0int:3 sows had better litter growth compared to FF sows (LMM, EM: FNB 324 g/day vs. FF 298 g/day, p=0.03).
On farm 1, there was no difference in the farrowing duration or the piglet birth intervals between the farrowing treatments. On farm 2, farrowing treatment affected the total duration of farrowing (p=0.01), birth interval between 1st – 5th piglets (p=0.04) and 1st – 10th piglets (p<0.01); both the total duration of farrowing and both birth intervals were shorter for FF sows compared to TC0int:3 sows.

Discussion and Conclusion

In conclusion, farrowing strategies have different effects depending on the farm. These results might partly be due to both farrowing pens were designed for TC. Furthermore, farm 1 normally uses TC0:3 and farm 2 TC0int:3.

WEL-OP-05

EVALUATION OF ANAESTHESIA QUALITY FIVE YEARS AFTER INTRODUCTION OF AUTOMATED ISOFLURANE ANAESTHESIA IN PIGLET CASTRATION

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Background and Objectives

Since 2021, castration of male piglets without anaesthesia is prohibited by law in Germany as was already envisaged in the Brussels Declaration 2018. As a result, approximately 40 % of piglet producing farmers in Germany opted for isoflurane anaesthesia. Five years afterwards, this study aims to evaluate how automated isoflurane anaesthesia has become established under field conditions, with a particular focus on anaesthesia quality.

Material and Methods

Overall, the study evaluates 52 farrowing farms across Germany ("non-intensively trained farms", NIF) and compares them with 10 farms that had received intensive support and training during the implementation of isoflurane anaesthesia 5 years ago by the LMU Munich ("intensively trained farms", IF). Defensive movements and vocalisations during skin incision and transection of the spermatic cord were assessed from video recordings using an established scoring system. Isoflurane concentration within the anaesthesia masks, induction time, and correct execution of the surgical procedure were also evaluated.

Results

To date, 2,515 castrated piglets on 35 NIF and 10 IF farms have been evaluated. Overall, 79 % achieved a score of 0-1 for defensive movements and vocalisation. Across NIF farms, 75 % of piglets achieved a score of 0-1, compared to 85 % on IF farms. Higher scores (indicating stronger reactions) were associated with suboptimal induction times (both too short and too long) as well as technical issues affecting isoflurane delivery.

Discussion and Conclusion

This project provides a representative field evaluation of automated isoflurane anaesthesia in German pig production. Previous results demonstrate that the method is generally feasible under commercial conditions, yet the overall outcomes indicate a need for further optimisation, particularly regarding the consistency of anaesthetic depth. The difference between NIF and IF farms highlights the importance of structured onboarding and regular training. Overall, automated isoflurane anaesthesia remains a viable and welfare-oriented method for piglet castration, but continued efforts are required to ensure reliable performance across farms.

WEL-OP-06

IMPACTS OF ENVIRONMENTAL AND SOCIAL ENRICHMENT ON HEALTH INDICATORS FOLLOWING AN ENTEROTOXIGENIC E . COLI CHALLENGE

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Background and Objectives

Post-weaning diarrhoea is a multifactorial disease, with housing conditions as one of the contributing factors. This study investigated the impacts of environmental and social enrichments on health indicators of piglets challenged with enterotoxigenic E. coli (ETEC) in experimental settings.

Material and Methods

A total of 119 specific pathogen-free piglets were divided from birth onwards between two contrasting housing conditions: minimal (MIN) versus enriched (ENR). MIN pigs had two fixed enrichments: a rubber ball and a rope. ENR piglets had rooting material (wood shavings), a rotation of objects and they were subjected to early socialisation. Ten days after weaning (37.5 ± 1.9 days of age) and for each housing condition, piglets were orally inoculated with either ETEC (challenged group) or sterile broth (control group). We monitored piglets' health for four weeks, with regular clinical observations, faecal and blood sampling. We collected jejunum samples at the end of the experiment for histological analysis.

Results

Among the 60 challenged piglets, 39 developed diarrhoea (24 ENR, 15 MIN; $P = 0.031$) and ENR pigs shed more ETEC than MIN pigs at four days post-inoculation ($P = 0.045$). ENR pigs had higher levels of D-lactate compared to MIN pigs ($P < 0.001$) although preliminary results of jejunum histology suggest that there was no difference in villi atrophy between housing conditions four weeks post-inoculation ($P = 0.782$). There was also no difference in plasma cortisol between housing conditions ($P = 0.715$).

Discussion and Conclusion

Environmental and social enrichment appeared to influence piglets' responses to an ETEC challenge by increasing diarrhoea expression, bacterial shedding as well as intestinal permeability, as suggested by higher D-lactate. However, no clear effects on intestinal structure nor endocrine function were observed. In practice, farmers and veterinarians should balance enrichment for welfare benefits with careful monitoring and strategies to support gut health.

FLASH TALKS

FTP-OP-01

BBD – Bacteriology and Bacterial Diseases

CASE-CONTROL PILOT STUDY ON SALMONELLA IN IRISH PIG FARMS: KEY FINDINGS FOR ESTABLISHING A BACTERIOLOGICAL SURVEILLANCE SYSTEM

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Background and Objectives

Ireland has a National Salmonella Control Programme (NSCP) based on serology and aims to integrate bacteriological analyses as well. A baseline assessment of farms nationwide was conducted.

Material and Methods

Sixty-four farms, selected based on Salmonella seroprevalence in meat juice (2010-2019), were sampled in this case-control study. Faecal samples were collected from pig pens for microbiological analysis, and a targeted questionnaire captured management practices, biosecurity, productivity, vaccine usage, and clinical disease data. Isolated Salmonella serotypes underwent antimicrobial resistance (AMR) profiling.

Results

Of the 220 samples collected (123 from finisher pens, 97 from weaners pens), 78 tested positive: 41 (33.3%) from finisher pens and 37 (38.1%) from weaner pens. The most common serotypes were monophasic variant of Salmonella Typhimurium (47.4%), S. Typhimurium (17.9%), S. Derby (16.7%), and S. Give (10.3%).
AMR testing of 42 isolates showed 12 (28.6%) were fully susceptible, 9 (21.4%) resistant to one or two antibiotics, and 21 (50%) resistant to three or more. Notably, no S. Typhimurium isolates were fully susceptible, and over 75% of monophasic S. Typhimurium isolates exhibited multidrug resistance.

Discussion and Conclusion

The findings show the widespread presence of Salmonella in Irish pig farms, with a predominance of monophasic S. Typhimurium, a serotype frequently associated with zoonotic risk and AMR. The levels of multidrug resistance, particularly among S. Typhimurium and monophasic S. Typhimurium, raise concerns about treatment options and the potential for transmission through the food chain. These results highlight the need for enhanced biosecurity, improved vaccination strategies, and antimicrobial stewardship to mitigate Salmonella prevalence and resistance.
This study lays the groundwork for developing the bacteriological component of the NSCP, guiding evidence-based interventions to reduce infection rates and AMR in the Irish pig sector. Future efforts should focus on continuous surveillance, farm-level risk assessments, and the implementation of best practices to improve overall herd health and food safety.

FTP-OP-02

HHM – Herd Health Management

MODELLING FEED INTAKE PATTERNS FOR EARLY DETECTION OF HEALTH AND MANAGEMENT EVENTS IN FATTENING PIGS

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Background and Objectives

Precision livestock farming (PLF) enables continuous monitoring of production parameters and supports the detection of health and welfare deviations. Feed intake is a potential indicator of disease in growing-finishing pigs, but baseline patterns must be characterized to identify abnormal events. This study aimed to describe the normal feed intake patterns during the fattening period using electronic feeders and to evaluate whether deviations from expected intake can detect "incidence days", defined as days with health issues or routine management procedures.

Material and Methods

Data from two batches of a commercial pig farm equipped with electronic feeders provided individual daily feed intake records throughout the fattening period (17-19 weeks). Incidence days, including respiratory and digestive problems, mortality, and vaccination events, were available from farm records. For each batch, a Generalized Additive Model (GAM) was fitted to model expected daily feed intake, and alarm signals were generated when residuals exceeded 1.5 standard deviations from the prediction. Model performance was assessed by evaluating its sensitivity, specificity, precision, negative predictive value, and accuracy.

Results

Daily feed intake increased progressively with age and exhibited a circadian rhythm. Marked decreases in feed intake were observed in individuals the days preceding fatalities. The alarm system, designed to detect "incidence days", reached high specificity in both batches (95.9% and 95.0%), while sensitivity was 72.7% in Batch 1 and 54.5% in Batch 2, the latter likely affected by the imbalanced dataset.

Discussion and Conclusion

Feed intake patterns were characterized under commercial conditions, in days of incidence, and in the days preceding mortality. Deviations from the predicted GAM curve reliably identified health or management disturbances, demonstrating the potential of this approach as a PLF-based early-warning tool for monitoring growing-finishing pigs. Further validation across additional farms and production systems is recommended.

FTP-OP-03

IMM – Immunology and Vaccinology

INFLUENCE OF SOW VACCINATION ON SUCKLING PIGLET GUT MICROBIOTA AND PERFORMANCE

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Background and Objectives

Neonatal diarrhoea (ND) remains one of the leading causes of early-life mortality in piglets, with the intestinal microbiota playing a central modulatory role. Given that the sow strongly shapes her offspring's microbiota through different mechanisms, this study aimed to evaluate whether maternal vaccination against Clostridium perfringens, Clostridioides difficile, and Escherichia coli could promote a more resilient gut microbiota in piglets by reducing the incidence of ND.

Material and Methods

Twenty sows from a farm with a history of ND were included. Ten received SUISENG® Coli/C mixed with SUISENG® Diff/A (HIPRA, Girona, Spain), while the remaining ten served as unvaccinated controls. Both groups were vaccinated against Rotavirus A. Two to three piglets per sow were selected for faecal sampling during the first four days after birth and again at weaning (day 28). Faecal consistency was monitored over the first eight days of life using a 0–3 scoring system (0=normal; 3=watery). Body weight was assessed at multiple timepoints from birth to weaning. Microbiota composition was analysed by 16S rRNA gene sequencing. Blood samples were collected weekly for biomarker assessment.

Results

Maternal vaccination significantly reduced the incidence and severity of neonatal diarrhoea, resulting in improved body weight. Moreover, piglets from vaccinated sows showed lower blood concentrations of Interleukin-6 and haptoglobin ($P < 0.05$). Piglets from vaccinated sows exhibited higher abundances of short-chain fatty acid (**SCFA**)-producing taxa, including a greater Ruminococcaceae family abundance and an increased Butyricimonas genus ($P < 0.001$). By day 28, additional differences emerged, with higher relative abundances of SCFA-producing taxa such as Anaerovoracaceae, Ruminococcus_gnavus_group, Dorea, and Elusimicrobium ($P\delta$ 0.086), alongside a reduced abundance of potentially pathogenic bacteria including the taxa: Dialister, Helcococcus, and Peptoniphilus ($P < 0.001$).

Discussion and Conclusion

Overall, maternal vaccination promotes a microbiota enriched in beneficial SCFA producers, a reduction in neonatal diarrhoea, and an improved growth performance in piglets.

FTP-OP-04

MIS – Miscellaneous and Clinical cases

INFORMING SMARTER BIOSECURITY PRACTICES THROUGH VEHICLE NETWORKS: A BRAZILIAN SWINE SYSTEM STUDY

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Background and Objectives

Vehicle movements are a major route for pathogen dissemination in swine production systems. While many sites require minimum downtime or truck washes between visits, empirical assessments of compliance are rare. This study used GPS-enabled monitoring to reconstruct vehicle movement networks in a Brazilian swine system, quantify downtime compliance and evaluate whether high-centrality sites were associated with non-compliance proportions.

Material and Methods

A GPS-tracked geolocation system (Biorisk®External) monitored seven vehicles (half of the system's fleet) from May-November 2025, across 16 operational sites: nine swine farms, a feed mill, three slaughterhouses and three truck wash stations. Consecutive visits were linked by vehicle to reconstruct site-to-site directed movement networks and calculate downtime intervals. Visits violating predefined downtime or skipping washing stops were classified as non-compliant. Network degree, betweenness and strength centrality were calculated using R-software. Non-compliance proportions were estimated per site and associations with centrality metrics were assessed using univariate quasibinomial logistic regressions.

Results

Of all vehicle movements, 32.2% (317/985) were non-compliant. Three vehicles accounted for 68.8% of all violations, with feed-mill-to-finisher movements contributing the most (27.8%). Wash stations reset risk in only 12.0% of visits (117/985), too infrequently to meaningfully reduce system-wide risk. Non-compliance was highest for grower-finisher and finisher farms (66-74%) and lowest for the farrow-to-wean unit, despite its heavy traffic. Total strength showed a significant negative association with non-compliance (OR=0.26; p=0.02, 95%CI: 0.09-0.60), indicating that each unit increase in movement volume reduced the odds of non-compliance by roughly 74%.

Discussion and Conclusion

Vehicle monitoring appeared to be a powerful tool for exposing biosecurity vulnerabilities within a swine system. High-traffic sites showed better compliance, potentially reflecting more structured protocols and trained personnel. Targeted education, simplified scheduling and more consistent wash-station routing could improve system-wide biosecurity. Focusing interventions on lower traffic sites may yield the greatest risk-reduction benefits.

FTP-OP-05

MIS – Miscellaneous and Clinical cases

GENE EXPRESSION OF THYMIC HORMONES IN ANIMALS WITH PERIWEANING FAILURE TO THRIVE SYNDROME (PFTS) AND DEPENDING ON THYMIC ATROPHY

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Background and Objectives

Porcine Periweaning Failure to Thrive Syndrome (PFTS) is an emerging disease affecting swine production, characterized by growth retardation and progressive debilitation in the first week's post-weaning. Thymus atrophy appears to be the most consistent lesion in the pathological picture of diseased pigs. This study aims to study gene expression for thymic hormones genes, related with serum levels of thymulin and the thymus atrophy level.

Material and Methods

Samples from lymphoid organs (thymus, tonsil, lymph node and spleen) and serum from 60 piglets (5 healthy and 5 sick from six affected Spanish farms) were taken for histopathological and serological studies. Three of the farms raised Iberian pigs and three raised white pigs, enabling evaluation of potential differences between racial and management factors. Gene expression for Protomsin (PRO), Thymopoyetin (TMPO), thymosin ®-4 (T®4), thymosin ®-10 (T®10), thymosin ®-15 (T®15) was assayed by q-PCR. The thymus glands were classified as normal (N), atrophied (A), and severely atrophied (SA).

Results

There were no significant differences when comparing gene expression in thymus N with thymus A. However, differences were observed when comparing N thymuses with SA thymuses for PRO (p=0.002), TMPO (p=0.021), and T®4 (p=0.017) and when comparing A thymuses with SA for PRO (p=0.001), TMPO (p=0.045), T®10 (p=0.024), and T®4 (p=0.001), which was always underexpressed in SA thymuses. There were no correlation with seric thyamulin.

Discussion and Conclusion

The cause of thymic atrophy in PFTS remains unclear, but it is evident that mRNA production for PRO, T®4, and T®10 is significantly reduced in animals with the most severe atrophy. Given the function of these hormones (T lymphocyte maturation, promotion of the expression of specific receptors on the lymphocyte membrane, cell migration, tissue repair, and inflammatory response), their involvement in the etiology of the disease needs to be studied in greater depth.

FTP-OP-06

MIS – Miscellaneous and Clinical cases

BLOODY DIARRHEA IN FATTENERS – BEYOND THE LAWSONIA LINE

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Background and Objectives

If a herd is vaccinated against Lawsonia intracellularis, but still shows signs of bloody diarrhea, it may raise concerns about whether the vaccine is working effectively. However, such assumptions may not accurately reflect the underlying etiology. In these cases, antibiotic metaphylaxis may prove ineffective.The objectives of this study are to highlight the role of other pathogens and to promote the use of targeted laboratory diagnostics to support evidence-based therapeutic decision-making.

Material and Methods

The investigation was conducted on a commercial fattening farm consisting of eight identical pens, with a total capacity of 6,000 pigs. One batch (3,000 pigs) can be housed in four pens.Despite vaccination of the pigs with Porcilis®Lawsonia IM, cases of bloody diarrhea were observed during the first third of the fattening period.Pooled fecal samples (5 individual samples per pool) were collected from the affected batch and submitted for the following laboratory tests: Aerobic bacterial culture Salmonella enrichment, PCR testing for Brachyspira hyodysenteriae, low-pathogenic Brachyspira species, and Lawsonia intracellularis.In addition, environmental conditions, vaccination history, and clinical observations were documented to aid interpretation of the laboratory results.

Results

Beta-hemolytic Escherichia coli was isolated from all pooled samples. Low-pathogenic Brachyspira species were detected in 75% of the samples. All samples tested negative for Lawsonia intracellularis, Brachyspira hyodysenteriae and Salmonella spp.Multiplex PCR analysis of the isolated E. coli strain revealed the presence of the eae virulence factor gene which is a key virulence factor in pathogenic E. coli. MIC analysis was performed, identifying effective antibiotics from AMEG categories D and C.

Discussion and Conclusion

Pooled fecal sampling combined with molecular diagnostic techniques such as PCR, serves valuable tool for the differential diagnosis of enteric diseases in fattening pigs.Accurate pathogen identification not only facilitates the prudent antibiotic use and improves therapeutic outcomes but also informs biosecurity measures and herd-level management strategies.

FTP-OP-07

MIS – Miscellaneous and Clinical cases

CONTAMINATION OF A SWINE FARROW-TO-FINISH HERD BY AN H3N2 INFLUENZA A VIRUS OF HUMAN ORIGIN: CLINICAL CONSEQUENCES AND SEROLOGICAL INVESTIGATIONS

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Background and Objectives

A farmer reported in January 2025 unusual respiratory clinical signs on fattening pigs. The person in charge of the follow-up of the growing pigs reported influenza-like illness few days before. We investigated a possible reverse zoonotic influenza episode and proceeded to samplings.

Material and Methods

The herd is a 300-sows farrow-to-finish herd located in a low density area of pig production. In February, blood samples were taken from 5 fattening pigs and 15 multiparous sows. Five sows out of these 15 were sampled a second time, 4 months later. We also analysed 5 archived sera sampled on fattening pigs early after and before the outbreak, respectively. Sera were analysed by ELISA and hemagglutination inhibition (HI) assays using antigens representative of swine influenza A virus (swIAV) lineages circulating in France. Due to the epidemiological context, human H1N1 and H3N2 antigens were included.

Results

No clinical sign and technical performances deviation were observed in the sow herd. All sows (and all fattening pigs sampled in January and February) tested seropositive by ELISA while negative by HI tests towards swIAV of $H1_{av}N1$, $H1_{av}N2$, H1N1pdm, $H1_{hu}N2$ and H3N2 lineages. Contrariwise, whereas also negative towards the H1N1 human strain, sera from sows and fattening pigs were all positive towards the H3N2 strain circulating in the human population during the winter. The five sows still showed H3N2 positivity in June.Sera obtained before the outbreak were negative by ELISA.

Discussion and Conclusion

The hypothesis of a human origin of the herd contamination is widely put forward. The employee who was sick consulted his doctor who performed a rapid diagnostic test, negative to COVID-19 but positive to IAV. In any case, this event is an opportunity to remind people working in contact with animals of the importance of prevention (vaccination) and biosecurity when dealing with the flu-like symptoms.

FTP-OP-08

VPH – One Health: Veterinary Public Health and Sustainable Pig Production

STRENGTHENING FMD PREPAREDNESS IN PUERTO RICO: EVALUATING KNOWLEDGE GAPS AND TRAINING OUTCOMES

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Background and Objectives

Puerto Rico (PR) is vulnerable to the threats of transboundary animal diseases (TAD) like Foot-and-Mouth Disease (FMD). The risk is particularly significant in swine due to widespread feral swine population, garbage feeding practice, and their higher susceptibility to infection and virus amplification. This study aimed to (1) assess baseline knowledge, attitudes, and practices (KAP) on TAD risks and prevention among PR livestock stakeholders; and (2) implement and evaluate survey-guided FMD educational workshops.

Material and Methods

A cross-sectional online KAP survey was administered from April–June 2025 using QualtricsXM. Findings informed the design of FMD educational producers' & trainers' workshops (n=4) conducted across PR in June 2025. The workshops were evaluated using a mixed-methods approach guided by the Kirkpatrick evaluation framework. Descriptive statistics, mixed-effects logistic regression (term recognition (0/1) on time (pre/post)), and thematic analysis for open-ended responses were conducted in RStudio.

Results

Seventy-two complete survey responses were analyzed. Respondents included veterinarians (42%), animal health workers (22%), students (12%), producers (11%), and others (12%). About 20% of the respondents were associated with swine production. Awareness of specific diseases varied, highest for Highly Pathogenic Avian Influenza (73%), with producers reporting the lowest TAD awareness (19%). Across the four FMD-specific workshops, 81 participants attended (40% animal health workers, 23% producers, 15% others, 13% students, and 9% veterinarians). Median recognized term number increased from 5 to 10 (4.5 pt improvement; 95% CI: 4.0–5.0). Mixed-effects logistic regression demonstrated substantial learning gains post workshop (OR = 37.25; 95% CI: 21.89–63.40; $p < 0.001$). Most participants cited FMD clinical signs as new knowledge, and the biosecurity tabletop model as the most valuable component. Observers reported moderate to high engagement, highest during hands-on activities.

Discussion and Conclusion

Findings demonstrate critical gaps in TAD awareness among PR stakeholders, particularly producers. Targeted workshops showed improvements in FMD knowledge and preparedness, underscoring the value of continued training to strengthen local response capacity.

FTP-OP-09

MIS – Miscellaneous and Clinical cases

A NEWBORN PIGLET CASE WITH PCV2D-ASSOCIATED NEUROLOGICAL DISORDER

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Background and Objectives

Porcine circovirus type 2 (PCV2) is a major pathogen in pigs, associated with diverse syndromes collectively known as PCV-associated diseases (PCVAD). Neurological disorders related to PCV2 have been rarely reported in weaned or growing pigs, and not in neonates. This case report describes a newborn piglet exhibiting severe neurological symptoms due to PCV2d infection and aims to highlight the neurotropic potential of this genotype.

Material and Methods

A three-day-old piglet from a commercial farrow-to-finish farm in Central Greece presented with tremors, ataxia, convulsions, and recumbency. Postmortem examination included gross pathology, histopathology and molecular testing (RT-PCR) for viral and bacterial pathogens.

Results

No gross lesions were detected. Histopathological examination revealed mild to severe vascular congestion in the brain without inflammatory infiltrates. Molecular analyses were negative for other pathogens but confirmed PCV2 in brain and lymph nodes. Phylogenetic analysis showed 99.84% nucleotide identity with a reference PCV2d strain (Han8 genotype), confirming infection with the PCV2d genotype.

Discussion and Conclusion

This case represents, to our knowledge, the first report of PCV2d-associated neurological disease in a newborn piglet. The findings broaden the clinical spectrum of PCV2d, indicating potential neurotropism in neonatal pigs. The case underscores the need to include PCV2 in the differential diagnosis of neurological disorders in piglets and raises concerns regarding the efficacy of PCV2a-based vaccines against emerging PCV2d strains. Further research is required to elucidate PCV2d pathogenesis and assess current vaccination protocols in breeding herds.

FTP-OP-10

MIS – Miscellaneous and Clinical cases

RELIABILITY OF SURFACE SAMPLING TO ASSESS FECAL SHEDDING OF ENTERIC PATHOGENS IN PIGLETS

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Background and Objectives

Post-weaning diarrhea (PWD) remains a persistent challenge in swine production. Accurate monitoring of pathogens is essential for controlling outbreaks and assessing farm-level health. The aim of this study was to evaluate the validity of surface sampling to estimate the excretion of Escherichia coli and Rotavirus A in weaned piglets, in comparison with the reference method based on rectal swabs.

Material and Methods

Fourteen farms with different PWD health statuses (control, diarrhea, vaccinated against postweaning colibacillosis) were included. Rectal swabs were collected from 9 to 21 weaned piglets per farm, along with three environmental swabs (feeder, pen floor, pen wall) from the corresponding pens. Rectal swabs were analyzed by qPCR for Rotavirus A and the following E. coli virulence factors: STa, STb, LT, F4, and F18. Using the difference between the qPCR limit of detection and the Cq values for each farm, radial plots were generated for both rectal and environmental swabs, calculating the area of the resulting polygons, with larger areas indicating higher excretion. Differences between health statuses were assessed using logistic regression, and correlations between rectal and environmental samples were evaluated via Pearson correlation.

Results

Both pathogens were detected in rectal swabs from all farms, although F4 fimbriae were absent in three farms and the LT toxin in two. Regarding environmental swabs, only LT was not detected in two farms. The area of the polygons was significantly smaller for environmental swabs compared to rectal swabs ($p < 0.001$), indicating a lower pathogen load. However, no significant differences ($p > 0.05$) in fecal excretion or environmental contamination were observed when comparing PWD health statuses. Interestingly, a good correlation ($r = 0.66$; $p < 0.01$) was observed between the polygon areas of rectal and environmental swabs.

Discussion and Conclusion

Environmental swabbing can be a practical and representative tool for monitoring farm-level PWD pathogen excretion.

FTP-OP-11

REP - Reproduction

LITTER LOSSES IN LACTATING LOOSE HOUSED SOWS: ALTRENOGEST PREVENTS ALTERED POST-WEANING OESTRUS

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Background and Objectives

Modern European pig production systems are increasingly focused on sow welfare, and many herds are moving towards the abandonment of farrowing crates. However, this transition is associated with a higher risk of piglet crushing. Beyond the productive and welfare implications, a sudden reduction in suckling stimulation may also trigger a neuroendocrine stress response in the sow, potentially leading to premature ovarian activation during lactation and altering the resumption of post-weaning oestrus. This study aimed to evaluate the effect of altrenogest administration during late lactation on post-weaning oestrus expression in sows experiencing partial litter loss.

Material and Methods

A total of 100 loose housed sows (parity 1–8) were included in the study, with temporary confinement limited to the periparturient period. Animals were recruited when cumulative pre-weaning litter losses reached ε30% of an average of 13.8±1.6 live-born piglets prior to weaning (6±1 days), and were randomly assigned to Control or Treatment (5mL altrenogest, Virbagest®, Virbac, orally once daily starting from the day when cumulative litter losses first reached ε30% until one day before weaning). Weaning-to-oestrus interval (WOI) and return-to-oestrus rate within 7 days after weaning (RO7) were recorded and analyzed (Kruskal–Wallis and chi-square test).

Results

The treated group showed a significantly shorter WOI compared to control (4.11±3.8 vs 9.8±14.2 days; p=0.011). The RO7 was higher in the treatment group (97.2% vs. 81.6% in controls; p=0.027).

Discussion and Conclusion

The shorter WOI observed in treated sows may be hypothesized to be related to the endocrine consequences of partial litter loss. Reduced suckling may decrease inhibitory feedback on GnRH and LH secretion, potentially predisposing ovulation during lactation and delayed visible oestrus after weaning. Although endocrine mechanisms were not directly assessed, altrenogest administration during late lactation may have counteracted this premature activation, supporting ovarian rebound synchronization with weaning under the study conditions.

FTP-OP-12

VPH – One Health: Veterinary Public Health and Sustainable Pig Production

EFFECT OF AN ISOTONIC PROTEIN DRINK ON PIGLET WEANING WEIGHT: A META-ANALYSIS OF 46 FIELD STUDIES

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Background and Objectives

Achieving higher piglet weaning weights is critical for long-term growth and overall production but remains challenging. We used a large collection of field studies to determine the effects of an isotonic protein drink (IPD) on piglet weaning weight across various management systems.

Material and Methods

Raw data from 46 field studies (2017-2026) across 15 countries (N=41,983 piglets) were analysed. Litters were randomly assigned to either an IPD group, which received a 3% solution of Tonisity Px (Tonisity International) provided in pans from days 2–8 of life and for 3 days pre-weaning; or Control. Controls received no supplementation (31 studies), water (8 studies), or an electrolyte/acidifier (7 studies). Within study, the two treatments were housed in the same rooms. Individual study weaning weight averages [calculated with PROC MIXED (SAS 9.4)] were aggregated and analysed as a mixed model for treatment LSMEANS±SEM, with weaning age as a covariate and study as random (JMP 19). The inverse of sum of within- and between-study variance was used as a weighting factor. Comparisons were stratified by Control additive type (no additive/water/competitor) and weaning age [early- (17–23 days) vs. late-weaned (24–32 days)].

Results

IPD-supplemented piglets were 300g heavier at weaning than Controls (6.42±0.11kg vs. 6.12±0.11kg; p<0.0001). This was consistent across early-weaned (17-23 days; 5.95±0.20kg vs. 5.62±0.20kg; p<0.0001) and late-weaned (24-32 days; 7.22±0.22kg vs. 6.94±0.22kg; p<0.0001) piglets. This effect was observed irrespective of Control protocol: no supplementation (6.78±0.16kg vs. 6.48±0.12kg; p<0.0001), water (6.49±0.32kg vs. 6.13±0.32kg; p<0.0001), or electrolyte/acidifier (6.50±0.33kg vs. 6.23±0.33kg; p=0.0005).

Discussion and Conclusion

The IPD improved piglet weaning weights across various management systems and weaning ages, indicating that micro-enteral nutrition is an effective early-life intervention to improve piglet pre-weaning growth under field conditions.

FTP-OP-13

VVD – Virology and Viral Diseases

HIGH-RESOLUTION MAPPING OF PRRSV-1 DISTRIBUTION IN TARGET TISSUES USING RNASCOPE IN SITU HYBRIDISATION

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Background and Objectives

Understanding the spatial distribution of porcine reproductive and respiratory syndrome virus (PRRSV) in infected tissues is essential for elucidating viral pathogenesis. Although PCR is the gold standard for diagnosis, histopathology and immunohistochemistry are traditionally used to assess infection in tissues. However, these approaches rely on semi-quantitative scoring systems with well-known limitations in accuracy and reproducibility, which can restrict their ability to evaluate viral localisation precisely. This study aimed to apply RNAscope in-situ hybridization (ISH) combined with quantitative digital histopathological analysis to characterize viral distribution in target tissues with greater precision.

Material and Methods

Five 4-week-old piglets were intranasally inoculated with the PRRSV-1 strain 3249 and euthanized at 14 days post-infection. Lung, thymus, tonsil, and tracheobronchial lymph node samples were fixed in formalin and processed for RNAscope ISH. Whole-slide images were acquired using a digital scanner and quantitatively analysed using an artificial intelligence-based software platform (Visiopharm) to determine viral RNA signal density and spatial patterns.

Results

Marked differences in viral distribution were observed among tissues. The highest density of PRRSV-1 signal was detected in the tonsils and lungs, followed by tracheobronchial lymph node and thymus. In the lung, a viral positive signal appeared as multifocal red dots, primarily associated with macrophage-like cells within areas of interstitial pneumonia and bronchopneumonia. In tonsils and lymph nodes, markedly higher viral positive density was observed within lymphoid follicles, particularly in germinal centres. In the thymus, PRRSV-1–positive cells were present in both cortex and medulla, although animals with higher PRRSV-1-positive signal showed a predominance of viral signal in the cortical region.

Discussion and Conclusion

High-resolution RNAscope ISH combined with digital image analysis provided a detailed spatial map of PRRSV-1 distribution, identifying lungs and tonsils as the most markedly infected organs in this model. This integrated approach improves objectivity in evaluating viral tropism and represents a powerful tool for advancing PRRSV pathogenesis research.

FTP-OP-14

WEL - Animal Welfare and Ethology

ANALYSIS OF BEHAVIOUR AND UTILISATION OF SELF-SERVICE WALLOWS IN FATTENING PIGS

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Background and Objectives

Rising temperatures and extreme weather due to climate change increase heat stress in pigs. With limited thermoregulation abilities, pigs rely on behavioural cooling strategies like wallowing. This study investigated how fattening pigs use self-service showers to form wallows in response to increased temperature and humidity.

Material and Methods

Two wallows (W1: solid floor; W2: slatted concrete floor) could be created by pigs in one structured pen (38 pigs) in two batches (batch 1: March-June; batch 2: July-September) on a farm in Germany. Pressing a button triggered a water flow onto the wallow area. Timing and number of activation events were recorded. Datalogger continuously recorded temperature and humidity and temperature-humidity-indices (THI) were calculated. Video recordings were analysed for the fifteen days with the highest and lowest THI, focusing on wallowing duration and number of animals wallowing.

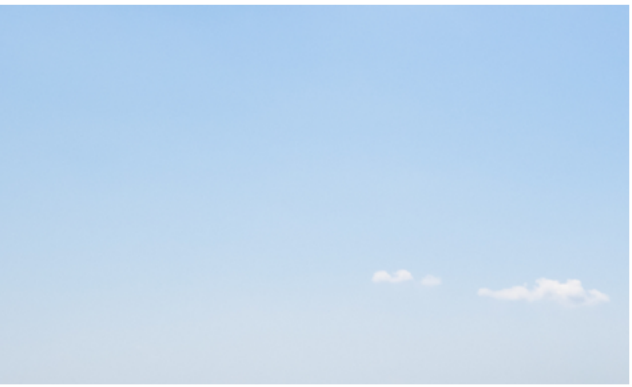
Results

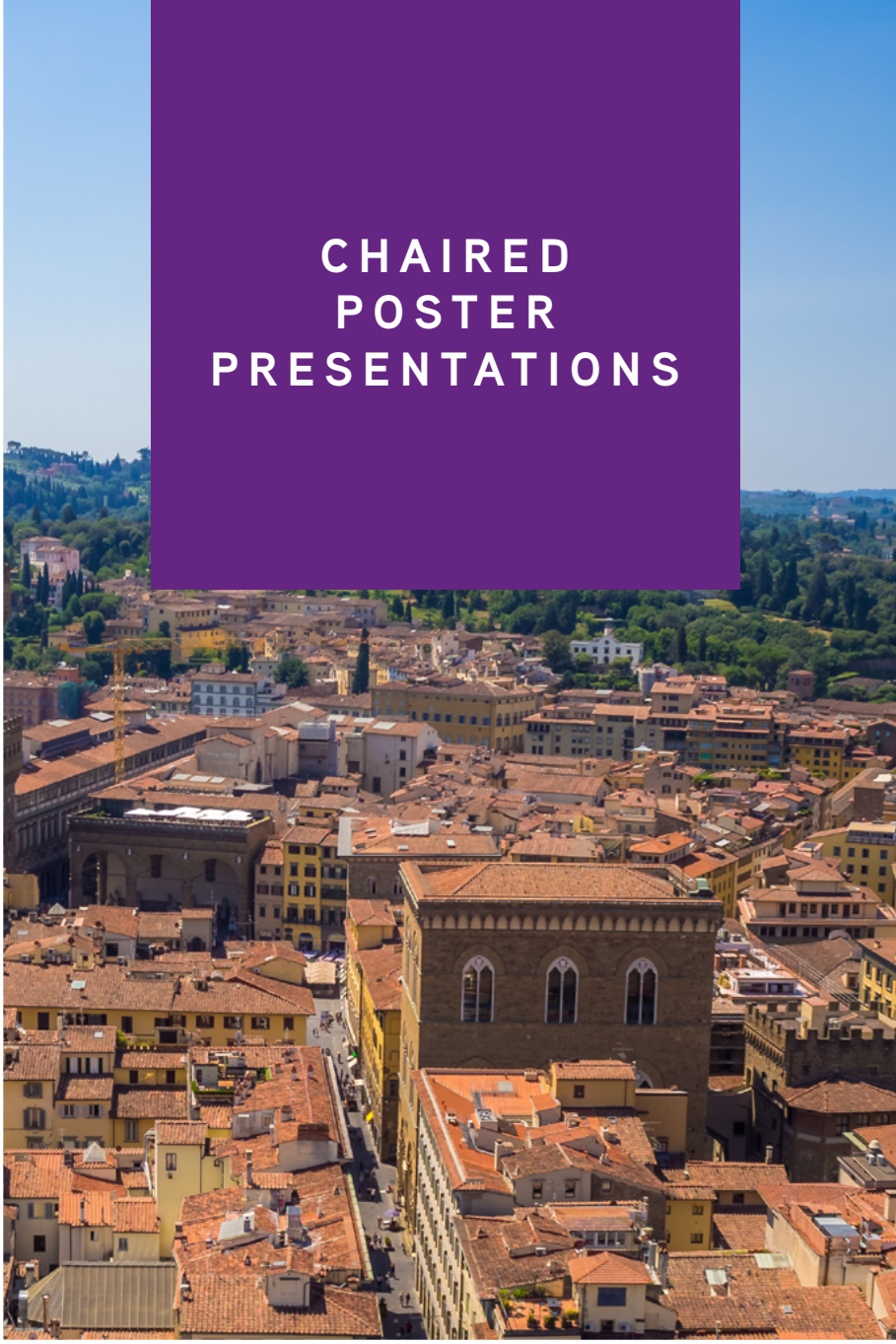
The total number of shower activations was 5,562 (W1) and 3,830 (W2). Wallowing was observed 1,426 times in W1 and 550 times in W2. THI ranged from 51.6 to 70.8 (batch 1) to 65.4 to 76.5 (batch 2). In batch 1, wallowing activity increased consistently with rising THI, with significant correlations between THI and number of pigs wallowing (W1: $\rangle$=0.82, W2: $\rangle$=0.69) as well as between THI and average wallowing duration (W1: $\rangle$=0.75, W2: $\rangle$=0.76). In batch 2, significant correlation was only present between THI and number of pigs wallowing in W1 ($\rangle$=0.75). For all other parameters, no significant correlations were found ($\rangle\delta$0.2, pε0.23).

Discussion and Conclusion

Findings indicate that pigs purposefully use self-service wallows in response to increasing heat. During the summer batch, there was consistently a high motivation to exhibit wallowing behavior. Differences between the wallows may be due to varying floor types or positional effects.This research was funded by the Lower Saxony Ministry of Science and Culture and the Volkswagen Foundation as part of the zukunft.niedersachsen program.

CHAIRED POSTER PRESENTATIONS





BBD-CP-01

BBD – Bacteriology and Bacterial Diseases

HIGH MULTIDRUG RESISTANCE RATES AND EPIDEMIOLOGICAL SHIFTS IN MAJOR BACTERIAL PATHOGENS OF SWINE RESPIRATORY DISEASE IN BRAZIL

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Background and Objectives

Swine respiratory diseases are a major challenge due to multifactorial nature, economic impact, and rising antimicrobial resistance. Pasteurella multocida (PM) and Actinobacillus pleuropneumoniae (APP) are important pathogens, acting as primary or secondary agents and often associated with severe lung lesions. This study characterized clinical PM and APP isolates by serotype, virulence factors, geographic distribution, and antimicrobial resistance.

Material and Methods

Isolates were obtained from clinical samples collected in different Brazilian swine production systems across multiple states (2023–2024). The first study analyzed 50 isolates of PM type A, positive for the pfhA virulence gene, while the second study evaluated 257 APP isolates. The clinical samples underwent bacteriology, qPCR, histopathology, and diskdiffusion antimicrobial susceptibility testing. Antimicrobial resistance profiling followed CLSI disk diffusion methods and was interpreted using CLSI and EUCAST guidelines, classifying isolates as susceptible, intermediate, or resistant. Multidrug-resistant isolates were defined as those resistant to three or more antimicrobial classes. Last, descriptive analyses were performed on the data.

Results

The 50 pfhA-positive isolates of PM were predominantly recovered from abscessing lung lesions and fibrinous pleuritis. Antimicrobial testing revealed that 66% of the isolates were multidrug-resistant, with high resistance rates totetracyclines, aminoglycosides, and florfenicol.The second study showed that serotypes 4, 8, 5, and 18, along with non-typeable strains, accounted for more than 80% of APP isolates, with significant shifts in serotype prevalence between 2023 and 2024 — particularly increases in serotypes 4 and 5. Antimicrobial susceptibility testing of 200 APP isolates showed alarming resistance rates, with 98% classified as multidrug-resistant, especially to doxycycline, gentamicin, tetracycline, ampicillin, and florfenicol.

Discussion and Conclusion

These results show alarming multidrug resistance in major swine respiratory pathogens in Brazil, threatening animal health, treatment efficacy, and public health. Integrated control is essential, including strong biosecurity, antimicrobial use guided by susceptibility testing, and vaccination strategies adapted to serotype variability to prevent spread of resistant strains.

BBD-CP-02

BBD – Bacteriology and Bacterial Diseases

RETROSPECTIVE STUDY OF DANISH HERDS WITH HIGHLY RESISTANT, HEMOLYTIC ESCHERICIA COLI

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Background and Objectives

Danish pig farmers cannot use antibiotics considered critically important to humans, e.g. colistin, so for treatment of weaned pigs with Escherichia coli (E. coli), 11 antibiotics are relevant. An increasing number of cases from the Veterinary Laboratory in Kjellerup identify hemolytic E. coli resistant to most of these 11 products. To investigate patterns in submissions, a dataset was compiled including all cases with hemolytic E. coli and susceptibility testing. The aim was to describe characteristics of cases with highly resistant E. coli and identify differences compared to cases with low/moderate resistance.

Material and Methods

Data was extracted from the laboratory database covering April 2022 to September 2025, including anonymized case information. For some cases from 2025 , the herd veterinarians told the laboratory she/he wanted to participate in a background interview. High resistance was defined as resistance to at least 10 out of 11 clinically relevant antibiotics, based on epidemiological or clinical breakpoints for MIC test. Statistical comparison between groups was performed with $|^2$-test (significance level p=0.05).

Results

Of 894 cases (527 herds), 83 (57 herds) involved highly resistant E. coli, with an increasing proportion over the period. Cases with high resistance were more likely to originate from herds experiencing clinical problems, with higher rates of "diarrhea" in the anamnesis and identification of enterotoxigenic E. coli. Routine submissions rarely yielded highly resistant strains. Interviews with herd veterinarians from 4 herds with high resistance revealed persistent clinical issues and treatment failures, often requiring changes in antibiotic regimens. Data extraction from the laboratory database could not confirm a higher rate of treatment failure with high resistance, possibly due to incomplete anamnestic information.

Discussion and Conclusion

Highly resistant hemolytic E. coli cases are more often associated with clinical problems. Presence of high resistance was linked to treatment failure in interviews, but not statistically confirmed in the dataset.

BBD-CP-03

BBD – Bacteriology and Bacterial Diseases

SALMONELLA SEROTYPES AND ANTIMICROBIAL RESISTANCE IN PIG FARMS IN NORTHERN IRELAND IN 2025

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Background and Objectives

Salmonella is the second most common cause of foodborne disease in many countries, including Northern Ireland. It is associated with more deaths than other foodborne disease.
The aim of this study was to find Salmonella serotypes in seven farms with historical salmonellosis background. The isolates were tested for antimicrobial resistance (AMR) which could, potentially, be difficult to treat in humans if transferred by ingesting contaminated meat.

Material and Methods

Pooled faecal samples (H50 grams) were collected from dry sows, lactating sows, weaners, growers and finishers at each farm. The samplese were sent to SAN-Vet, Germany, They were inoculated in pre-warmed buffered peptone water and incubated. The culture was transferred onto MSRV (Merck) selective medium and incubated. Presumptive Salmonella colonies were subculture and confirmed by biochemical, mass-spectrometric and serological methods for serotyping. Isolates were tested for AMR by determinasing the minimum inhibiroty concentration (MIC) using a microtiter plate assay (MICRONAUT-S Gro®tiere, Bruker).

Results

Twenty-eight Salmonella isolates were obtained from 166 samples. The main isolated serotype was monophasic S. Typhimurium (11), followed by S. Rissen (7), S. Typhimurium (5), S. Derby (4) and S. Panama (1). Salmonella was mostly isolated from weaners, growers and finishers. No isolates were obtained from the lactating sows.
A wide range of AMR was observed among the different Salmonella isolates. S. Panama exhibited the highest level of AMR, whereas S. Typhimurium and S. Derby showed the lowest AMR.
All the isolates were resistant to colistin, erythromycin, tiamulin and tilmicosin.

Discussion and Conclusion

mST was the predominant serotype in the analysed farms, consistent with findings from other studies.
The results of this study highlight the importance of a responsible use of antimicrobials in order to prevent AMR. This brings a concern with human foodborne infections with AMR serotypes that could potentially be difficult to treat in affected patients and increasing medical cost and mortality.

HHM-CP-01

HHM – Herd Health Management

EVALUATION OF SOW HEMOGLOBIN LEVELS: INFLUENCE OF BLOOD COLLECTION SITE AND SAMPLING TIME

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Background and Objectives

HemoCue®Hb201+ is commonly used on farms to assess hemoglobin concentration (HbC) in sows, with blood collected from the tail or ear. Previous studies, McClelland (2025), have suggested that HbC may differ according to sampling site due to variations between central and peripheral blood. In humans, circadian fluctuations in HbC have also been reported (Kimura 2009; Sennels 2011; Bäckman 2016). The objective of this study was therefore to determine the influence of sampling site and time of day on HbC measurements in sows.

Material and Methods

HbC of 121 sows from three commercial farms were measured using HemoCue®Hb201+ by a single trained operator. For each sow, blood was collected from the ear, the tail and the mammary vein in the morning and in the afternoon. Sows were classified as anemic when HbC was <100 g/L (Thorn, 2010).

Results

No significant differences were observed in HbC or in the proportion of anemic sows between morning and afternoon sampling ($p > 0.05$). Correlation between sampling sites was moderate to high ($r = 0.7$). Mean HbC were significantly higher in the mammary vein (108.2 g/L) compared with the tail (107.1 g/L) and ear (104.5 g/L) ($p < 0.001$). The proportion of anemic sows was highest when using ear samples (37%), compared with tail and mammary vein samples (28 and 21%) ($p < 0.001$).

Discussion and Conclusion

Our results suggest that sampling site is a key determinant of measured HbC and may bias herd-level estimates of anemia prevalence. It is therefore preferable to compare measurements and establish thresholds using samples collected from the same anatomical site.. Future work should include repeated sampling of the same animals and at the same sampling sites to assess the repeatability of measurements, as well as sampling from the jugular vein in order to directly compare field-accessible sites with the established gold standard and improve on-farm recommendations.

HHM-CP-02

HHM – Herd Health Management

NEONATAL BATCH PRRS-STATUS AFFECTS PRODUCTION RESULTS IN THE FARROWING ROOM

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Background and Objectives

PRRSV-1 is endemic in the Netherlands. Over 90% of sow herds are vaccinated, and monitoring shows that 55% of herds have PRRS PCR-positive farrowing batches each quarter. In endemic farms economic losses up to slaughter can reach median €255 per sow annually. Despite this, many farmers underestimate PRRSV's impact already in the farrowing room. This retrospective study analyzed farrowing performance relative to neonatal PRRSV status.

Material and Methods

Four conventional sow herds (H1500 sows each) monitored neonatal piglets via PRRS PCR using processing fluids or tongue fluids from dead piglets. Samples were categorized as first parity (P1), second parity and older (P2+), or mixed (x). Farrowing batch data were matched with farm management records. Statistical tests included Chi-square and Wilcoxon signed rank.

Results

A total of 323 farrowing batches were analyzed; 22.3% tested PRRSV positive. Positivity by parity: P1 25.6%, P2+ 15.2% ($X^2(1, N=174)=2.914$, $p=.088$). Across farms, PRRSV-positive batches showed reduced farrowing rate (up to -4.2%), fewer live-born piglets (up to -0.53 per litter), and fewer weaned piglets (up to -0.82 per litter). By parity, P1 batches had the greatest impact: farrowing rate decreased by -5.2% and live-born by -0.35 piglets per litter ($p<.005$).

Discussion and Conclusion

PRRSV around farrowing significantly reduces productivity. PRRSV-positive batches weaned on average 1.1 fewer piglets per litter. For a 1000-sow herd with 22.3% prevalence, this equals ~571 fewer piglets marketed annually—about €30,000 in losses at 2025 prices. First parity sows are more likely to farrow PRRSV-positive piglets, emphasizing the need for gilt acclimatization. These findings highlight the importance of PRRS control and farmer awareness.

HHM-CP-03

HHM – Herd Health Management

CHARACTERISATION OF BIOSECURITY PRACTICES IN A MULTIPLE SITE PYRAMIDAL PIG PRODUCTION SYSTEM IN SPAIN

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Background and Objectives

Pyramidal integrated pig production systems can improve efficiency but may favor pathogen spread across the production chain. This study assessed biosecurity practices on 265 farms belonging to one company to identify the main vulnerabilities in their pig production flow.

Material and Methods

Biosecurity was evaluated using the Biocheck.UGent® questionnaire. Breeding (n=48), weaning (n=29), fattening (n=160), and gilt rearing (n=28) units were surveyed from May 2024 to November 2025, via on-site visits (60%) or telephone interviews (40%). Collected data were uploaded to an online platform for subsequent descriptive analysis with RStudio (version 4.4.3).

Results

While biosecurity measures were generally well applied among the studied farms (score 48-93%, med=62%), some critical gaps were identified. For instance, 6.3% of breeding units did not quarantine gilt replacement, 22% did not perform AI/AO in gilt quarantine areas, and cross-fostering occurred multiple times per piglet (52%). In gilt rearing units, some farms lacked clean and dirty areas in changing rooms (47%). Several weaning units were not appropriately fenced (24%), and in some fattening units, manure (43%) and carcasses (42%) were present in the clean area. Some other weaknesses were common to all farm types: for example, animal transport vehicle drivers could access the stables when loading animals (38% of weaning units and 73% of fattening units), although while wearing farm-specific clothing. Additionally, between 38% and 73% of farms did not have carcass storage areas protected from pet, scavenger, or vermin access.

Discussion and Conclusion

Breeding units play a vital role in preventing pathogens from entering production systems. Biosecurity gaps identified through this study can make them vulnerable to pathogen introduction, especially through animal movements. Improved biosecurity in gilt rearing, weaning, and fattening units is essential for preventing further spread of pathogens. Reinforcing measures such as fencing and safer carcass storage could help mitigate this risk.

IMM-CP-01

IMM – Immunology and Vaccinology

BROAD VACCINE NEUTRALIZATION AND PROTECTION FROM SWINE AND HUMAN H1N1 INFLUENZA VIRUSES CHARACTERIZED IN THE PIG MODEL

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Background and Objectives

Influenza A viruses (IAVs) pose a recognized global health threat to people and pigs. Vaccination remains the most effective intervention, protecting at both population and individual level. Human seasonal influenza vaccine effectiveness still varies due to viral genetic diversity vaccine antigen matching. This study describes proof-of-concept of a novel vaccine antigen platform in the swine model.

Material and Methods

Digitally Immune Optimized haemagglutinin (HA), neuraminidase (NA), and matrix-2 vaccine antigens were engineered and combined in single DNA expression construct (DVX-H1N1) to maximize the breadth of the immune response elicited to seasonal, pandemic, and zoonotic H1N1 IAVs. The DVX-H1N1 candidate was evaluated in an influenza challenge model and compared to two whole inactivated virus (WIV) vaccines. Pigs were prime-boost vaccinated and intranasally challenged 10 weeks later.Longitudinally, antibody levels were monitored using for immune responses elicited to HA, NA and viral nucleoprotein (NP). Day 42 sera were also evaluated against H1 and N1 pseudo virus (PV) panels. Daily nasal swabs samples were used to quantify viral RNA shedding by RT-qPCR during the challenge phase. All statistical analysis of variance (ANOVA) and associated post hoc tests were performed in comparison to the control groups (RStudio).

Results

The DVX-H1N1 vaccine candidate elicited immune responses comparable to the WIV vaccines. Anti-H1 neutralizing responses to homologous and heterologous antigens were detected in all immunized pigs against the majority of H1 PV tested and showed NAI activity against all N1 PV tested 42 days post immunization. Viral RNA shedding was significantly suppressed in the DVX-H1N1 and the homologous WIV vaccinated groups, while the naive control and heterologous WIV vaccinated groups showed high levels of shedding.

Discussion and Conclusion

Overall, these findings demonstrate that the DVX-H1N1 vaccine induced the same robust protection as the strain-matched WIV vaccine in the swine model, while inducing breadth of neutralization activity across a broad spectrum of human and swine H1N1 strains undergoing antigenic drift and reassortment.

IMM-CP-02

IMM – Immunology and Vaccinology

EXPERIENCES WITH SEROLOGICAL RESPONSE AND SAFETY, AFTER SIMULTANEOUS AND CONCURRENT USE OF PORCILIS® ROTA AND PORCILIS® COLICLOS IN PREGNANT SOWS UNDER COMMERCIAL CONDITIONS

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Background and Objectives

Rotavirus A and enterotoxigenic Escherichia coli (ETEC) are major causes of neonatal diarrhea in piglets. Vaccination of pregnant sows is used to enhance lactogenic immunity. Mixing vaccines can streamline workflows, but requires evidence of safety and immunogenicity and that was the goal of the study.

Material and Methods

Field trial in a 5,000-sow farm: primiparous sows in Control (no vaccination; n=5) CG, Separate Porcilis® Rota and Porcilis® ColiClos at different sites (n=20) SG, and mixed administration before injection (n=20) MG. Two doses: 4 weeks pre-farrowing, revaccination 2 weeks later. Safety: rectal temperature, feed intake, local/systemic reactions. Immunogenicity: serum antibodies to Rotavirus A and E. coli (K88AC/AB, K99, 987P, LT) in sows at three timepoints and piglets (CG n=6, SG n=18, MG n=18)

Results

Safety was acceptable in all groups. Post-vaccination temperature increases did not differ significantly among groups after dose 1 (0h p=0.540; +6h p=0.461; +24h p=0.701 across comparisons) or revaccination (0h p=0.620; +6h p=0.331). All animals maintained normal feed intake; no local or systemic reactions were observed.

Rotavirus A, vaccinated groups (MG vs SG) showed similar antibody levels at all timepoints and were higher than controls: first bleed 1.25 vs 1.11 (p=0.021), second bleed 2.05 vs 2.04 (p=0.018), third bleed showed a trend 1.42 vs 1.46 (p=0.069). Piglet antibody levels were also higher in vaccinated groups (mixed 1.54; separate 1.55) versus control (1.05). E. coli antigens, vaccinated groups mounted robust responses across K88AC, K88AB, K99, 987P, and LT, with similar titers between mixed and separate administration and clearly exceeding controls at all timepoints.

Discussion and Conclusion

Mixing Porcilis® Rota with Porcilis® ColiClos for co-administration in pregnant sows was safe and elicited antibody responses comparable to separate administration and superior to no vaccination. These data support combined use to simplify farm management without compromising safety or immunogenicity.

IMM-CP-03

IMM – Immunology and Vaccinology

SWINE PARVOVIRUS: AN INVISIBLE THREAT TO REPRODUCTIVE PERFORMANCE

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Background and Objectives

The Porcine Parvovirus type 1 (PPV1) is an important pathogen in porcine reproductive disorders. On French farms, the most prevalent PPV1 strains detected are 27a-like strains. The objective of the study was to monitor reproductive performance, under field conditions, with and without PPV1 vaccination prevention, on a farm facing an active circulation of the PPV1 27a-like strain.

Material and Methods

On a 400-sow farrow-to-finish farm, reproductive parameters, such as the percentage of success after first mating, the number of piglets born alive, mummified piglets, and weaned piglets, were routinely recorded by the farmer. Lineal and logistic regression tests were employed to analyze the data of 1 499 litters. After a 9-month interruption of ERYSENG® PARVO (NADL-2 Strain) vaccination, a PPV1 27a-like strain was detected by PCR and sequencing of the lungs of mummified piglets. This study compares two periods: nine months without PPV vaccination and only Swine Erysipelas vaccination (NV group) and a whole year of results after the re-implementation of the NADL-2 strain vaccine (V group).

Results

The success rate in first mating, reflected fertility was better in V sows than in NV sows with 92.8% and 90.4% respectively.Statistically significant differences were observed in all reproductive parameters ($p<0.001$) which improved after the re-implementation of NADL-2 strain vaccination: from 15.77 to 16.99 piglets born alive, 0.92 to 0.62 mummified piglets and 13.29 to 14.49 weaned piglets respectively.

Discussion and Conclusion

V sows showed better reproductive results than NV. The NV group of sows was more susceptible to being infected by endemic PPV1 27a and suffered reproductive clinic effects. On that farm, sow vaccination with ERYSENG® PARVO was an effective method to prevent the deleterious impact of PPV1 27a-like on reproductive performance.

MIS-CP-01

MIS – Miscellaneous and Clinical cases

TWO CASES OF LEPTOSPIROSIS WITH TWO DIFFERENT CLINICAL OUTCOMES

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Background and Objectives

Leptospirosis in sows is associated with abortions, SMEDI (stillbirth, mumification, embryonic death, infertility), and stillborns. Haemolytic icterus has been reported in suckling piglets following intrauterine infection. Both outcomes were seen in two Austrian farms. These cases highlight the importance of direct pathogen detection in clinically apparent cases, as serological testing alone may be insufficient to confirm the diagnosis.

Material and Methods

Case 1: A sow herd experienced late-term abortions and stillborn litters following a massive rodent incursion after a major flooding event. Case 2: Several gilt litters presented with a high proportion of icteric newborn piglets, accompanied by an elevated mortality rate.

Results

Case 1: A pooled foetal organ sample (kidney, lung, liver) tested positive for Leptospira (L.) interrogans by PCR. Liver histopathology revealed severe, acute, multifocal to coalescing, suppurative-necrotizing hepatitis. Initial MAT testing in paired serum samples from sows, however, did not show seroconversion. Only after extending the antigen panel, antibodies against L. serovars Bataviae and Copenhageni were detected. Case 2: In icteric piglets, Mycoplasma (M.) parvum and L. were identified by PCR. MAT testing was positive for L. serovar Pomona (up to 1:3200). In both cases, clinical signs resolved after doxycycline treatment, followed by herd vaccination against Leptospira (entire herd in Case 1; gilts only in Case 2) as a long-term control.

Discussion and Conclusion

These two cases illustrate the variability of clinical outcomes, ranging from reproductive disorders in sows to hemolytic icterus in piglets. Case 1 underlines the diagnostic challenges of leptospirosis: paired serum samples failed to demonstrate seroconversion in standard MAT testing, emphasizing the importance of direct pathogen detection. In case 2, L. serovar Pomona is consistent with the clinical signs, while concurrent M. parvum infection may have aggravated disease severity. Both cases show the relevance of combining antimicrobial treatment with vaccination as long-term control. Case 1 further stresses the need for effective rodent control and biosecurity measures.

MIS-CP-02

MIS – Miscellaneous and Clinical cases

SOWS REMOVED FOR LOCOMOTOR PROBLEMS: OTHER CONCOMITANT LESIONS AT NECROPSY

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Background and Objectives

Locomotor problems are currently one of the leading causes of sow culling. Among the proposed causes for this problem are rapid growth, pregnancies and nursing of very large litters, and the high metabolic rate that this entails. Many affected sows, even after receiving appropriate treatment, do not respond and end up being slaughtered. This study aims to determine whether other macroscopic lesions are present in the necropsy of sows removed for this reason.

Material and Methods

In a system with 9,000 sows in south-eastern Spain, a farm necropsy was performed on 67 sows that had been removed, in which operators registered lameness or some type of locomotor problem as the main cause (Nov' 24-Aug'25).

Results

Of the total number of sows necropsied, only 38.8% had no other type of lesion. 43.9% were in a state of cachexia when they were culled. 29.9% had cystitis and 25.4% had pulmonary lesions. To a lesser proportion, 6% had rectal prolapse or endometritis. The stomach was full and distended in 4.5% of cases, and 3% had renal cysts, splenomegaly, pleuritis, or mucohaemorrhagic diarrhoea. The remaining findings appeared in only one animal of the total (1.5%).

Discussion and Conclusion

The fact that almost half of the sows were cachectic reflects that they were animals with chronic deterioration. Furthermore, the high proportion of cystitis and lung lesions may indicate that animals with lameness are predisposed to these conditions. Thus, although the primary cause may be the locomotor problem, over time, other lesions may develop. Failure to take these into account and treat them may compromise the animals' successful recovery. Our data suggests that almost two thirds of animals dying by lameness-related problems have other concurrent pathologies.

MIS-CP-03

MIS – Miscellaneous and Clinical cases

IMPACT OF NANONISATION ON FLORFENICOL RECOVERY WHEN USED IN A PROPORTIONER

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Background and Objectives

Florfenicol demonstrates poor solubility in water, resulting in precipitation and crystallisation when used at therapeutic dose in highly concentrated stock solutions. The suitability for use in proportioners was investigated for two liquid florfenicol-containing products: a standard florfenicol formulation and Amphen® 200 mg/ml nanonised florfenicol. Nanonisation is an advanced formulation technique based on particle size reduction.

Material and Methods

Pigs (25.5 kg bodyweight), housed in the same compartments under the same conditions, were assigned to two treatment groups: Group 1 (n=462): nanonised florfenicol - Group 2 (n=465): standard florfenicol formulation. Pigs were treated with 10 mg florfenicol/kg bodyweight/day. Medicated water was consumed within 12 hours after start of administration using a proportioner set at a 1% injection rate. At start of the trial, the two stock mixtures showed equal florfenicol concentrations and volumes. Both mixtures were stirred for 20 seconds. The visual appearance in the proportioners and the florfenicol recovery at nipple level and in plasma were investigated. Water samples from 10 nipples and blood samples from 10 pigs were taken at different time points after administration start to determine florfenicol concentrations (HPLC).

Results

Substantial sedimentation of insoluble florfenicol crystals starting immediately after mixing was observed in the proportioner when using the standard florfenicol formulation. On the other hand, the nanonised formulation demonstrated excellent homogeneity throughout the administration period. Florfenicol recovery in the final drinking water was 3.6, 2.9 and 4.0 times higher than the standard formulation after 3, 6 and 10 hours, respectively. Plasma concentrations were 2.2, 2.8, 2.4 and 3.4 times higher after 6, 9, 12 and 24 hours, respectively.

Discussion and Conclusion

Nanonisation technology (Amphen® 200 mg/ml florfenicol) resulted in superior homogeneity in highly concentrated stock solutions and subsequently, in superior florfenicol recovery in drinking water and in plasma. The standard florfenicol formulation was not suitable for use via proportioners.

REP-CP-01

REP - Reproduction

URINE PROGESTERONE KIT VALIDATION TEST

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Background and Objectives

Staging of estrous cycle via progesterone (P4) measurement is essential for identifying reproductive issues in sows. Necessitates extended analytical turnaroun, whereas a rapid on-farm blood P4 kit enables immediate decision-making. Because venipuncture can be difficult, urine sampling may be an alternative. This study assessed whether a rapid serum-based P4 kit can be applied to urine, assuming urine excreted progesterone reflects serum progesterone and serum progesterone cutoff (10 ng/mL) applies to urine for binary classification

Material and Methods

Serum samples from 40 sows were divided into two aliquots: one analyzed in the laboratory via PNT-HOR-30409 (ELFA; ng/mL), the other tested on-farm with the MSD progesterone kit (five serum drops per test). Urine from the same sows was tested in parallel with the MSD kit (five urine drops per test). Kit results were read and classified as positive or negative (P4 > or < 10 ng/mL). Method agreement was evaluated with bilateral Fisher's exact test. Samples showing evidence of autolysis at the reference laboratory were excluded from agreement analyses to avoid misclassification

Results

Agreement between the MSD kit applied to serum and to urine was observed in 35 concordant positives and 3 concordant negatives (n = 38; Fisher's exact p < 0.001).Between the MSD kit (serum) and ELFA serum, concordance was significant (MSD 18+/3− vs ELFA 19+/2−; n = 21; p = 0.014).Between the MSD kit (urine) and ELFA serum, concordance was likewise significant (MSD 19+/3− vs ELFA 20+/2−; n = 22; p = 0.013)

Discussion and Conclusion

The rapid P4 kit concordance supports urine testing for binary classification around the 10 ng/mL threshold. Kit-derived serum values correlated well with ELFA, while urine results aligned closely with kit serum and ELFA results. Using urine as an alternative sample could reduce invasiveness, improve sampling practicality, and accelerate on-farm decisions for estrous-cycle staging and reproductive troubleshooting

REP-CP-02

NITRIC OXIDE PRECURSOR SUPPLEMENTATION DURING PERIPARTUM AND LACTATION IMPROVES FARROWING DURATION, PIGLET BIRTHWEIGHT AND COLOSTRUM QUALITY.

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Background and Objectives

Modern sow genetic has empowered animals to produce larger litter sizes which also had some consequences, one of the most significant being increased piglet mortality. Prolonged farrowing increases the risk of in-utero asphyxia and stillbirth, and many hyper prolific sows lack adequate nutrition for extended labour. Research suggests that specific nutritional recommendations around farrowing enhances piglet livability.
This study evaluated the impact of supplementing a nitric oxide precursor during peripartum and lactation on farrowing performance and colostrum quality.

Material and Methods

Sows were assigned to two treatments: a control group (C; n=51) and a treatment including 0.3 % Livapig® CC (Cargill Animal Nutrition & Health; LP ; n=87). Animals were fed from 5d pre-farrowing until weaning (28d).
Farrowing duration, performance and individual piglet birth weight were recorded. Colostrum samples were collected during 6 hrs starting at farrowing with an interval of 1.5 hrs, to measure solids content (BRIX %) using a refractometer.
Data on farrowing performance, birth weight, and colostrum quality were analysed using Linear Mixed-Effects models in R (v4.3.2).

Results

At birth, sows receiving LP supplement had more piglets born (+0.6 piglets; $P>0.05$) and their piglets had a higher birth weight compared to the control group (avg. 1.47kg vs 1.40kg ; $P>0.05$).
The average farrowing time was significantly shorter (1.07hrs) in LP group compared to control group (229 vs 296 minutes) ($P<0.05$).
The colostrum solids content (BRIX %) decreased physiologically over time ($p<0.001$), moreover this decline was slower within LP group ($P<0.05$). Consequently, LP sows had a significant higher colostrum solids content regardless of the time period (+6.3% improvement) ($P<0.05$).

Discussion and Conclusion

The use of LivaPig™ was associated with a significant reduction in farrowing time and improved colostrum quality, both key factors for increased piglet livability .

REP-CP-03

REP - Reproduction

EFFECTS OF IONIZED CALCIUM LEVEL OF FREE FARROWING SOWS ON THE FARROWING PROCESS AND LITTER PERFORMANCE

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Background and Objectives

An efficient farrowing process is critical for optimal reproductive outcomes and the health of both sows and piglets. While data specific to sows are currently limited, research in other species indicates that impaired uterine activity and extended farrowing duration may be linked to inadequate calcium levels. Consequently, this study aimed to assess the impact of ante-partum ionized calcium concentrations on the farrowing process and related parameters.

Material and Methods

In total, 58 sows in a free farrowing system were included in this study. Blood samples were obtained from the ear vein on average 4 days ante-partum (a.p.) and 6-12 hours post-partum (p.p.). Ionized calcium level was tested directly pen-side using LAQUAtwin CA-11C. Farrowing duration, piglet-piglet interval and need for obstetrical assistance (> 60 min piglet-piglet interval) were recorded. Statistical analyses included descriptive statistics, t-tests and Spearman/Pearson correlations ($p < 0.05$).

Results

The mean of total born piglets was 15.9 ± 4.0 with an average farrowing duration of 273 ± 110 min. Mean ionized calcium concentrations were 1.22 ± 0.07 mmol/L a.p. and 1.29 ± 0.16 mmol/L p.p.. There was a weak positive correlation between ionized calcium a.p. and p.p. (Spearman correlation coefficient r= 0.32; p = 0.017). No significant correlation was found between ionized calcium levels a.p. and farrowing duration (Spearman correlation coefficient r=-0.09; p = 0.53). In addition, no difference in calcium levels a.p. were observed in sow with farrowing assistance (n=21 / 1.22 mmol/L) or without farrowing assistance (n=36 / 1.22 mmol/L).

Discussion and Conclusion

Sows' a.p. ionized calcium levels did not affect farrowing duration. Further research is needed to clarify why maternal ionized calcium levels measured in blood samples appears unrelated to farrowing duration in free farrowing systems.

VPH-CP-01

VPH – One Health: Veterinary Public Health and Sustainable Pig Production

ISOLATION PENS – HOW SHOULD THIS BIOSECURITY MEASURE BE IMPLEMENTED?

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Background and Objectives

Animal welfare requires appropriate management of sick and injured animals. Isolation pens are essential to separate affected animals, yet key practical aspects—such as their required number, structural design, placement, and criteria for use—remain insufficiently defined. Current legal requirements across Europe provide limited guidance, therefore the aim of the study was to assess how field and official veterinarians evaluate necessity, capacity, design, and operational function of isolation pens in Austrian pig production.

Material and Methods

A survey was conducted among Austrian official (A, n=25) and herd veterinarians (B, n=43) using LimeSurvey. Questionnaire contained 16 items addressing necessity, required capacity, structural design, placement, and minimum standards for isolation pens.

Results

In percentage terms, responses regarding necessity of isolation were largely comparable between groups A and B for categories such as biters (A: 90.7%, B: 84.0%), severe injuries (A: 96.0%, B: 90.7%), and animals unfit for transport (A: 74.4%, B: 80.0%). However, considerable divergence was observed for animals with infectious diseases (A: 64.0%, B: 34.9%). Concerning the design of isolation pens, soft and enclosed lying areas, bedding, and retreat options were rated as more important by group A (84.0%, 88.0%, 68.0%) compared with group B (55.8%, 34.9%, 20.9%). Both groups agreed on the importance of effective animal observation (A: 76.0%, B: 74.4%) as well as the need for adequate cleaning (A: 96.0%, B: 95.3%) and disinfection (A: 92.0%, B: 90.7%).

Discussion and Conclusion

Survey results indicate herd, and official veterinarians do not fully align in their assessments. More detailed and uniform guidelines could support the establishment and management of isolation pens – supplemented with representative examples that reflect heterogeneous farm conditions – and could therefore foster a shared understanding among farmers, herd veterinarians, and regulatory authorities. Establishing such common standards would constitute an important step toward improving the protection and welfare of particularly vulnerable animals.

VPH-CP-02

VPH – One Health: Veterinary Public Health and Sustainable Pig Production

ASSESSMENT OF ISOFLURANE EXPOSURE DURING PIGLET CASTRATION ON GERMAN FARMS: IMPORTANCE OF WORKPLACE SAFETY AND DEVICE FUNCTIONALITY

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Background and Objectives

Since 2021, castration of male piglets without anaesthesia has been prohibited in Germany. One alternative is surgical castration under isoflurane anaesthesia, which may be performed by trained farmers without veterinary supervision. This study aims to evaluate device performance and worker exposure to isoflurane during piglet castration five years after implementation.

Material and Methods

The study evaluates 62 farrowing farms across Germany. From these, 15 farms were randomly selected for isoflurane exposure measurements, ensuring diversity in farm size and device type. Isoflurane concentrations were measured at five specified device- and person-related sampling points, for example, the inhaled air of the operator. Additional data were collected on barn ventilation, castration location, and reported worker health complaints.

Results

To date, isoflurane measurements are available from four farms, showing elevated personal exposure values on three of these farms, with ambient isoflurane concentrations of 15.7 mg/m³, 54.7 mg/m³ and 79 mg/m³. All three exceeded the German workplace exposure limit of 15 mg/m³, which aligns with international standards. One farm recorded a person-related exposure slightly above the limit (16.3 mg/m³) during piglet transport. Device-related measurement points, such as the anaesthesia gas funnel, showed particularly high values of 331.0 mg/m³, 351.4 mg/m³ and 167.0 mg/m³.

Discussion and Conclusion

Although only limited data have been analysed so far, the exceedances of isoflurane concentrations on three of the four farms highlight the need to further investigate isoflurane exposure, potential weaknesses and risk factors during isoflurane anaesthesia for piglet castration. Regular inspections of anaesthesia devices for proper function, leakage, and correct handling may improve occupational safety. Moreover, the findings emphasise the importance of adequate ventilation to protect worker health. Enhancing maintenance routines and on-farm safety standards may help reduce environmental impact and ensure a more consistent depth of anaesthesia in piglets.

VPH-CP-03

VPH – One Health: Veterinary Public Health and Sustainable Pig Production

PRESENCE OF GASTROINTESTINAL ENDOPARASITES IN SWINE HERDS FROM GALICIA (NW SPAIN)

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Background and Objectives

Gastrointestinal parasitoses represent a significant problem for both extensive and intensive swine farming systems due to their impact on productivity. Since data on the prevalence of these parasites in Galician swine herds is limited, a study was conducted to identify the main parasites in this region, their zoonotic potential and to assess some risk factors.

Material and Methods

Between July 2024 and May 2025, 125 faecal samples were collected in 38 swine farms and analyzed using the flotation in sucrose solution technique. A questionnaire was designed for collecting data on animal handling, biosecurity measures and parasite control practices.

Results

The results showed a high prevalence of gastrointestinal parasites (60%) in faecal pig samples as well as a high herd-level (89.5%). A total of 10 different parasites were identified, being Balantidium coli and coccidia the most prevalent (29-36%). Among coccidians, Cystoisospora suis and Eimeria spp. showed a similar prevalence, around 10%. Regarding helmints, strongyles and Ascaris suum were the most common (10-15%). Other parasites such as Giardia duodenalis, Trichuris spp., Strongyloides spp., spirurids and Macracanthorhynchus hirudinaceus presented the lowest prevalences, never exceeding 5%. The obtained results highlights the presence of zoonotic species such as A. suum, G. duodenalis and B. coli. Simple infections were more common than mixed ones, being double and triple co-infections the most frequent; five different parasites were identified in one sample. The prevalence of C. suis and Trichuris spp. decreased with age, reflecting the development of protective immunity.

Discussion and Conclusion

Extensive farming systems, lack of cleaning and desinfecting protocols, contact with wild boars and less experience in the swine sector appeared to be associated with higher parasite prevalences.Further research, obtaining a larger sample size, is needed to obtain more representative results to obtain a better knowledge of the health impact and zoonotic risk of parasitic infections in galician pig herds.

VVD-CP-01

VVD – Virology and Viral Diseases

GROUNDWATER SURVEILLANCE OF SWINE PATHOGENS FROM PRIVATE WELLS SUPPLYING IOWA SWINE FARMS

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Background and Objectives

Groundwater from wells is a poorly understood risk for pathogen transmission on swine farms. Pathogens on the landscape from swine manure can reach groundwater and contaminate wells, presenting a potential biosecurity risk. The objective of this study was to survey private wells supplying Iowa swine farms using dead-end ultrafiltration with subsequent quantitative polymerase chain reaction (qPCR) to characterize occurrence of swine pathogens and manure markers.

Material and Methods

Private wells supplying 40 unique commercial swine farms were sampled in the spring (n=20) and fall (n=20) of 2024. Enrolled farms included growing pig operations (n=36), breeding farms (n=3), and a nursery (n=1). Negative control samples were collected in the field for each field sample. Negative controls were tested for all organisms if the corresponding field sample tested positive for any organism. Samples were analyzed for 10 microbial gene targets using qPCR, which had positive and negative controls in the analytical process. Organisms included porcine reproductive and respiratory syndrome virus genotype 2, porcine epidemic diarrhea virus, porcine circovirus 2 (PCV2), rotavirus C, swine influenza A virus, Cryptosporidium spp., Salmonella spp., enteropathogenic E. coli, and two swine manure markers (pig Bacteroides).

Results

Swine pathogens and manure markers were detected in spring (n=7) and fall (n=3). Swine manure markers were detected most frequently (n=7). Other detections included Cryptosporidium spp. and PCV2 (δ 3 samples each); five samples contained two or more detected organisms. Tested control samples were negative for all organisms, except one control sample that tested positive for PCV2 and no other organisms.

Discussion and Conclusion

Results demonstrate that microorganisms, including swine pathogens, can contaminate private well water used for pig production. Findings indicate that groundwater may be a potential biosecurity risk for swine farms. Further study of waterborne pathogen transmission on swine farms will help inform water biosecurity practices in the swine industry.

VVD-CP-02

VVD – Virology and Viral Diseases

PATTERNS OF SWINE INFLUENZA DETECTION AND ISOLATION IN FIELD DIAGNOSTICS

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Background and Objectives

Swine influenza virus (SIV) remains a significant respiratory pathogen in European pig production, and information regarding its patterns of circulation, subtype distribution, and viral isolation performance continues to evolve. This study evaluated SIV PCR positivity, seasonal distribution, subtype prevalence, and the relationship between PCR Ct values and viral isolation outcomes using diagnostic data from 2023 to 2025 from herds mainly located in Belgium and the Netherlands.

Material and Methods

A total of 1,125 diagnostic submissions were tested for SIV by PCR, and 426 were positive. Submission dates were used to classify samples by season. Subtyping of PCR positive samples targeted hemagglutinin and neuraminidase genes. Viral isolation was attempted on a subset of positive samples, and Ct values were compared between culture positive and culture negative groups. Descriptive analyses were performed to assess seasonal detection patterns, subtype frequency, and the association between Ct and isolation success.

Results

PCR positivity remained relatively consistent throughout the year: 20,4% in Winter, 43,6% percent in Spring, 41,6% percent in Summer, and 45,6% percent in Autumn, indicating no clear seasonal peak. Among the 108 successfully subtyped samples, H1N1 predominated (73,1%), followed by H1N2 (25,9%) and H3N2 (0,9%). Viral isolation was strongly associated with Ct value. Culture positive samples (n = 21) showed lower Ct values (mean 23,75), whereas culture negative samples (n = 75) had higher Ct values (mean 26,71), confirming that higher viral loads increased the likelihood of successful isolation.

Discussion and Conclusion

These results support evidence that SIV circulates continuously in modern production systems, without a distinct seasonal pattern. H1 lineages remained the predominant subtypes in the evaluated herds, aligning with current European trends. The strong relationship between Ct value and isolation success highlights the practical value of Ct interpretation in routine diagnostics and may guide expectations for culture outcomes in field investigations.

VVD-CP-03

VVD – Virology and Viral Diseases

STRENGTHENING SWINE INFLUENZA SURVEILLANCE IN AUSTRIA THROUGH A MULTISECTORAL NETWORK: A PILOT STUDY FROM 2023 TILL 2025

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Background and Objectives

Swine influenza A viruses (swIAV) cause respiratory disease in pigs, resulting in economic losses and posing zoonotic risks. Until 2023, Austria lacked systematic swIAV surveillance, with only limited sequence data available since 1997. To address this gap, a pilot study was launched in 2023 under the United4Surveillance initiative (2023–2025; EU4Health Project ID 101102070), establishing a multisectoral network involving AGES diagnostic laboratories, a rendering plant, animal health services, the university of veterinary medicine, industry, and private veterinary practitioners.

Material and Methods

Passive surveillance from 2023–2025 used clinical submissions from pigs with respiratory disease, routine monitoring samples from a rendering plant in Lower Austria, and archived specimens dating back to 2018. Samples originated from Lower Austria, Upper Austria, Styria, and Carinthia and included lung tissue, nasal swabs, and RNA extracts. In total, 615 samples from 314 farms were tested, with 128 samples from 73 farms influenza A–positive. Of these, 78 were sequenced and 58 included in the final analysis. Next-generation sequencing was performed, and phylogenetic analyses included Austrian human influenza A sequences from the same period. Reverse zoonotic events were defined by near-identical clustering with human seasonal strains.

Results

Among the 58 analysed sequences, 44 (75.9%) belonged to the H1C lineage, including clades 1C, 1C.2.1, 1C.2.2, and 1C.2.4, with all 1C.2.4 viruses identified as H1avN2. Five sequences were H1N1pdm09 (1A.3.3.2) and four H1huN2 (1B.1.2.1), while no H3N2 subtype was detected. Three viruses clustered closely with human H1N1pdm09 strains, pointing toward a likely reverse zoonotic transmission.

Discussion and Conclusion

This pilot study generated Austria's first structured swIAV dataset across multiple regions. Although lineage frequencies reflect convenience-based sampling and may not represent national prevalence, the study demonstrates the feasibility and value of multisectoral surveillance. Expansion of systematic monitoring is essential to improve representativeness and strengthen animal and public health risk assessment of zoonotic influenza.

WEL-CP-01

WEL - Animal Welfare and Ethology

FECAL MICROBIOTA RESPONSE AND PERFORMANCE OUTCOMES IN WEANED PIGS FED PROTECTED BENZOIC ACID

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Background and Objectives

Feeding strategies for post-weaning piglets must carefully balance nutrition and gut health to support optimal growth. An innovative approach uses protected benzoic acid (PBA), stabilized in a hydrogenated lipid matrix, for targeted release in the gut. This gradual release creates an environment that inhibits pathogenic bacteria and promotes a balanced microbiota. The aim of this trial was to evaluate the potential benefits of PBA on the growth performance, survival rate, and fecal microbiota of post-weaning piglets.

Material and Methods

A large-scale trial was conducted at a commercial farm (Cincaporc S.A., Fraga, Spain), involving 30,000 piglets across five batches. Animals were assigned to two dietary treatments: 1) a control diet (CTR); and 2) CTR + PBA (2.5 kg/tonne) during the pre-starter and starter 1 phases. Growth performance and mortality were monitored. Microbiota composition was analyzed using fecal samples collected from three batches (80 total samples: Time 0, CTR, and PBA groups). Microbial diversity and profile were assessed using 16S rRNA gene sequencing.

Results

Mortality was significantly lower in the PBA group (−25%; $P<0.05$). Furthermore, piglets receiving PBA showed significantly higher alpha evenness diversity ($P<0.01$). At the genus level, PBA supplementation promoted the growth of beneficial bacterial taxa such as Muribaculaceae, Clostridia_UCG_014, Christensenella, and Ruminococcaceae_Candidatus_Soleaferrea.

Discussion and Conclusion

The increase in alpha diversity indicates a healthier, more balanced microbiota. The promotion of bacterial taxa known for their roles in polysaccharide metabolism and the endogenous production of short-chain fatty acids strongly suggests improved gut health and immune function. In conclusion, dietary supplementation with PBA positively affected post-weaning piglets by enhancing survival, promoting beneficial gut bacteria, and increasing microbial diversity. This demonstrates an effective, evidence-based strategy to support piglet health during the critical post-weaning period.

WEL-CP-02

WEL - Animal Welfare and Ethology

UTILISING HAIR CORTISOL CONCENTRATION, VITAMIN D, AND WEIGHT GAIN AS WELFARE INDICATORS IN ORGANIC PIGS

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Background and Objectives

Pig welfare depends on many factors and can be assessed through physiological and behavioural measures, but each approach has limitations, particularly in organic systems with marked seasonal variation. This study examined whether hair cortisol concentration (HCC), vitamin D status and weight gain are correlated in organically reared pigs, and whether combining these parameters can reflect animal welfare more reliably.

Material and Methods

Fifty-two Krškopolje pigs from a single Slovenian organic farm were assigned to three types of organic farms - two outdoor (n=20) and (n=17) and one indoor farm (n=15). Animals were sampled once per season (spring, summer, autumn, winter). Blood was collected from the cranial vena cava and hair from the withers area. Serum and hair were stored at −20 °C for 25(OH)D and HCC analyses, respectively. Body weight was estimated at each sampling using a validated morphometric formula (chest circumference and body length).

Results

Every 1 kg increase in weight gain predicts a 0.9 ng/g decrease in HCC ($p = 0.0018$), every 1 ng/ml increase in serum vitamin D concentration predicts a non-significant 0.2 ng/g drop in HCC ($p = 0.13$), every 1 kg higher starting weight is linked to a borderline-significant 0.8 ng/g lower HCC ($p = 0.055$). There was a positive interaction between Weight gain × Initial weight and HCC - for each extra kilogram of initial body weight, the reduction in HCC associated with weight gain becomes 0.02 ng/g smaller.

Discussion and Conclusion

Across the farms and throughout the seasons, pigs that gained weight more quickly also had lower HCC, suggesting that good growth is generally linked with reduced long-term stress. This was especially pronounced in pigs with lower starting weight. Vitamin D levels varied strongly by farm and season—consistent with differences in sunlight exposure and housing—but the association with hair cortisol was not significant.

WEL-CP-03

WEL - Animal Welfare and Ethology

GENETIC OPPORTUNITIES TO REDUCE SKIN DAMAGE IN PIGS

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Background and Objectives

Estimating the genetic effects of behaviour is challenging for several reasons: behaviour is largely influenced by environmental factors, behaviour is difficult to define, and data recording is often subjective and labour-intensive. An attractive methodology for estimating genetic parameters for behavioural traits is social genetic modelling, which allows us to estimate genetic effects on both individual and groupmate phenotypes. Additionally, new traits, such as the Swine Inflammation and Necrosis syndrome (SINS), could serve as a proxy for skin damage and help select against this trait at an early stage. The objective of this study was to evaluate the use of social genetic models to investigate the role of genetics on skin damage (DMG) in pigs, as well as the correlation between DMG traits and SINS recorded on newborn piglets.

Material and Methods

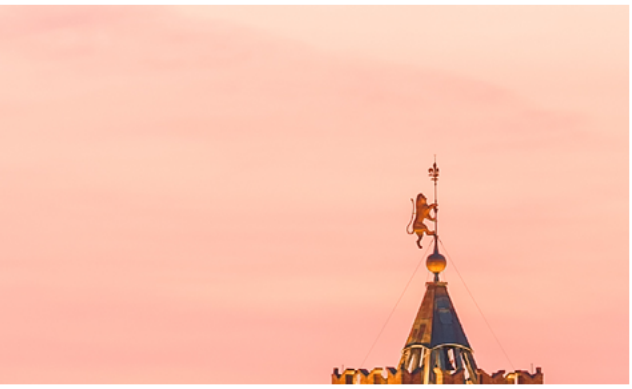
Two datasets were available for this study: 1) Swine Inflammation and Necrosis Syndrome (SINS) records for 7,000 pigs (scored at birth), and ear, tail, and flank damage scored on the same animals during rearing. 2) Tail damage (TD) records of 49,174 pigs.

Results

Heritability estimates for SINS and DMG ranged from 0.03 to 0.09, and genetic correlations between SINS and DMG traits ranged from 0.20 to 0.78. Heritability of receiving tail damage was estimated at 0.02 ± 0.01, and the ratio of total heritable variance over phenotypic variance, estimated with social interaction models, was 0.41 ± 0.09. A moderate, favourable genetic correlation (0.40 ± 0.07) was detected between the direct and indirect components.

Discussion and Conclusion

The results show that, while the majority of phenotypic variation influencing DMG is due to non-genetic factors, the inflicting and receiving of tail damage have a heritable component. Selecting against damage traits is possible using records for DMG, or the slightly higher heritable proxy trait SINS, which can also be recorded early in life and is highly correlated with DMG, or both.



POSTERS

BBD-PP-01

ANTIBIOTIC SUSCEPTIBILITY OF ENTEROCOCCUS HIRAE FROM PIGLETS WITH NNPD

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Background and Objectives

New neonatal porcine diarrhoea (NNPD) is a serious disease of newborn piglets, which may be associated with enteroadherent Enterococcus hirae. In this study, E. hirae isolates from diarrhoeic piglets in Sweden were tested to improve understanding of their antimicrobial susceptibility and its implications for treatment strategies.

Material and Methods

Enterococcus hirae was isolated from 48 untreated piglets (<1 week old) with recent-onset diarrhoea, originating from 13 herds. The isolates were species-identified using MALDI-TOF MS and tested for antibiotic susceptibility using broth microdilution.
Seven isolates with deviating beta-lactam MICs were further analysed using whole genome sequencing.

Results

Using epidemiological cut-off values (ECOFFs) for Enterococcus faecalis and E. faecium, 15/48 isolates (31%) showed elevated ampicillin MICs (>4 µg/ml), 19/48 isolates (40%) showed elevated penicillin MICs (>8 µg/ml), and 10/48 isolates (21%) showed elevated tylosin MICs (>32 µg/ml). Three isolates displayed reduced susceptibility to all three substances.
Of the sequenced isolates, four showed decreased MICs to beta-lactams (ampicillin δ0.25 µg/ml, ceftiofur δ0.25-0.5 µg/ml, penicillin δ0.12 µg/ml), and three isolates had MICs in agreement with E. faecium and E. faecalis. Sequence comparison of the susceptible versus non-susceptible isolates revealed that they differed in an amino acid in position 611 (A->T) located in the active site of penicillin-binding protein 5 (PBP5).

Discussion and Conclusion

Clinical experience indicates that penicillin or amoxicillin may be effective for the treatment of NNPD. In this study, however, E. hirae showed reduced susceptibility to penicillin, ampicillin and tylosin; and in some cases to all three substances. These results indicate that regular monitoring of treatment outcomes for NNPD is essential, including bacterial culture and antibiotic susceptibility testing. Sequencing results suggest that differences in PBP5 may explain varying susceptibility to beta-lactams in E. hirae. Mutations in PBP5 and PBP4 have previously been linked with reduced susceptibility to beta-lactams in Enterococcus spp.

BBD-PP-02

EFFICACY OF PHENOXYMETHYLPENICILLIN (PHENOXYPEN®) FOR THE METAPHYLACTIC TREATMENT OF AN EXPERIMENTAL STREPTOCOCCUS SUIS INFECTION IN PIGLETS

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Background and Objectives

Streptococcus suis is a major porcine pathogen worldwide and is endemic in most pig-rearing countries. The objective of this study was to determine the most efficacious dose of a narrow-spectrum in-water antibiotic (phenoxymethylpenicillin) for the treatment of an experimental Streptococcus suis infection in piglets of weaning age.

Material and Methods

40 weaned piglets with no clinical history of S. suis infection were divided in four groups and allocated to separated pens. A validated infection model was used to challenge all piglets by the intranasal route with a field isolate of S. suis serotype 2. On Days 1 to 5, animals from Group 2, 3 and 4 were administered phenoxymethylpenicillin added to 10 ml drinking water twice daily orally using a syringe. This resulted in a daily dosage of 5, 15 and 30 mg phenoxymethylpenicillin per kg body weight respectively. The animals from Group 1 were administered water only. Post-challenge clinical observations were performed as a minimum twice daily up to Day 6, involving rectal temperatures, demeanour, behavioural/CNS and mobility scores, followed with a single clinical examination before euthanasia conducted on Day 7. Post mortem, samples were collected from the brains for bacteriological and histopathological examination.

Results

Following challenge clinical symptoms consistent with S. suis infection (including 50% mortality) were only observed in Group 1. Colonies of S. suis were recovered from brain tissue from four out of five of the mortalities. In contrast, no mortalities, no clinical signs or S. suis recovery were observed in any of the treated animals.

Discussion and Conclusion

The results of the study indicated that all three dosages were effective in preventing development of clinical symptoms, mortality and bacterial recovery from brain tissue following experimental challenge with S. suis. Further studies are needed to confirm the efficacy and dosage of Phenoxypen® for treatment of S. suis infections under field conditions.

BBD-PP-03

ANTIBIOTICS SUSCEPTIBILITY PROFILES OF STREPTOCOCCUS SUIS, ACTINOBACILLUS PLEUROPNEUMONIAE AND PASTEURELLA MULTOCIDA STRAINS ISOLATED FROM SWINE DURING YEARS 2021-2024 IN THE NORTH EAST OF ITALY

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Background and Objectives

This paper presents the antimicrobial susceptibility pattern of S. suis, P. multocida and A. pleuropneumoniae strains, collected between 2021 and 2024 from diagnostic samples in north-eastern Italy.

Material and Methods

281 S. suis strains, 264 P. multocida strains and 106 A. pleuropneumoniae strains were enrolled.MIC was performed using broth microdilution method. The strains were classified as susceptible (S), intermediate (I) or resistant (R) based on clinical Break-Point (EUCAST, CLSI).

Results

P. multocida strains showed high prevalence (>80%) of susceptibility to the tested molecules, with the exception of tetracycline (57.2% S and 12.9% I) and tiamulin (69.7% S). For A. pleuropneumoniae, the data indicated that fewer than 75% of strains are susceptible to amoxicillin/clavulanic acid, ampicillin, kanamycin, spectinomycin, tetracycline, and tulathromycin. In S. suis isolates, the percentage of susceptibility was low for tetracyclines (1.8%). For the penicillins, the percentage of strains susceptible to ampicillin and penicillin was 93.2% and 65.8%, respectively.

Discussion and Conclusion

Considering P. multocida, the susceptibility for tiamulin was in contrasts with Hungarian data, where the percentage was 97.7%. For tetracycline, the result is comparable to Spanish data (60.8%, S).The susceptibility to tulathromycin in A., pleuropneumoniae was 74.5%, differently from what described in strains isolated in Hungary, Denmark, and Spain, where the value was about 100%. This is of noteworthy, as macrolides are classified by the WHO among the HPCIA. A low prevalence of tetracycline susceptibility for S. suis have already been reported in Sweden, Switzerland, and the Netherlands. Also, for S. suis, the different prevalence of susceptible strain for ampicillin and penicillin confirms the partial cross-resistance between these two penicillins reported in the literature.In order to have a prudent and rational choice of antimicrobial treatment, both an accurate diagnosis and the definition of the antimicrobial susceptibility pattern of the bacterial strains involved in the pathology maintains an utterly importance.

BBD-PP-04

PK/PD AND CLINICAL RELATIONSHIPS OF TULATHROMYCIN FOR SWINE RESPIRATORY DISEASE (SRD) TREATMENT

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Background and Objectives

The pharmacokinetics (PK) of tulathromycin (Huvexxin® - Huvepharma NV) in lung and macrophages following parenteral administration was related to tulathromycin MICs for M.hyopneumoniae (Mh), G.parasuis (Gp), P.multocida (Pm), B.bronchiseptica (Bb) and A.pleuropneumoniae (App) strains from Europe (pharmacodynamics - PD).

Material and Methods

The tulathromycin lung concentration was determined in a PK study with 36 pigs (bodyweight 20-25.5kg), which were medicated by single-dose i.m. injection (dose 2.5mg/kg bw). Pigs were euthanized on days 1, 3, 6, 10, 15 after treatment cessation to determine the tulathromycin concentration in blood and lungs.
Cellular uptake of tulathromycin in porcine phagocytic cells was determined in an in-vitro study.
Tulathromycin MIC data were generated based on susceptibility testing in pig respiratory pathogens from SRD cases in pan-European (BE, CH, DK, DE, FR, HU, IR, NL, ES, PL, UK) projects (2015 and 2016). 611 EU isolates were MIC tested (MIC dilutions: 0.001-128µg/ml) according to CLSI guidelines.

Results

The tulathromycin lung concentration was recorded at 3.47µg/g 24h post-dose and at 1.24µg/g 10 days post-dose. The tulathromycin macrophage concentration was recorded at 16.5µg/ml.
Tulathromycin concentrations in lung and alveolar macrophages exceed the MIC_{90} value for Mh (0.5), for Gp (2.0), for Pm (8.0) and for Bb (8.0). A lung elimination half-life $t_{1/2}$ of 142 hours (appr. 6 days) was found. The long half-life results in tulathromycin lung concentrations which remained at levels above 1.2µg/g for 10 days. Macrophage tulathromycin concentrations are substantially higher than in the lung and play an important role for definition of CLSI breakpoints (Pm, Bb δ16.0µg/ml; App δ64.0µg/ml - resistance ε64.0µg/ml) to provide therapeutic effect against respiratory pathogens.

Discussion and Conclusion

An excellent therapeutic effect of Huvexxin®(Huvepharma NV) in the case of treatment of SRD infections caused by M.hyopneumoniae, G.parasuis, P.multocida, B.bronchiseptica and A.pleuropneumonbiae is predicted, based on available PK/PD data.

BBD-PP-05

OBSERVATIONAL STUDY TO DETERMINE THE GENETIC SUSCEPTIBILITY TO ENTEROTOXIGENIC E. COLI F4 IN PIGS

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Background and Objectives

Post-weaning diarrhea (PWD), with enterotoxigenic Escherichia coli (ETEC) as one of the leading causes, is one of the most important diseases in the swine industry. Pigs may genetically be resistant to ETEC F4 due to lack of the genes encoding the receptors for fimbrial adhesion. While the genetic marker in MUC4 has been extensively studied, CHCF1 has been found a reliable and effective genetic marker for F4ab/ac susceptibility. The objective of this study was to determine genetic susceptibility to ETEC F4 based on MUC 4 and CHCF1 in post-weaning pigs with or without diarrhea.

Material and Methods

Rectal swabs and blood were collected from 10 diarrheic and 5 non-diarrheic pigs on each farm. Fecal swabs were cultured for E. coli, and the isolates genotyped by multiplex PCR. DNA was extracted from blood samples and used to test for polymorphisms in MUC4 by RFLP-PCR and the CHCF1 marker by a custom qPCR.

Results

Out of 270 pigs from 19 farms, 115 (42.7%) and 151 (56.3%) pigs were susceptible to ETEC F4 Based on MUC4 and CHCF1, respectively. However, there was a significant disagreement between the MUC4 and CHCF1 markers to identify the genetic susceptibility to ETEC F4 (McNemar test, $P<0.001$). Further, there was no significant association between diarrhea and genetic susceptibility to ETEC F4. However, pigs identified susceptible to ETEC F4 based on MUC4 (OR=3.3; P=0.02) or CHCF1 (OR=2.8; P=0.06) were more likely to shed ETEC F4.

Discussion and Conclusion

The disagreement between MUC4 and CHCF1 in classifying susceptible pigs to ETEC F4 may indicate that the CHCF1 is a superior genetic marker- as shown in the previous challenged trials- to determine the genetic susceptibility to ETEC F4. Further, it is possible that diarrhea was caused by other microbial agents leading to insignificant association between genetic susceptibility to ETEC F4 and diarrhea.

BBD-PP-06

DOES A BOOSTER VACCINATION AT THE START OF THE FATTENING PERIOD IMPROVE CONTROL OF MYCOPLASMA HYOPNEUMONIAE INFECTION IN PIGS?

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Background and Objectives

Mycoplasma hyopneumoniae remains a major health challenge in pigs despite widespread vaccination. Most vaccines are administered between one and three weeks of age to protect during the wean-to-finish period. However, the persistence of immunity and its effect on infection dynamics and performance are poorly understood. This study assessed whether a booster vaccination at the start of fattening reduces infection and improves growth under field conditions.

Material and Methods

A commercial farm with confirmed M. hyopneumoniae circulation was selected. Three hundred pigs from the same batch were randomly assigned to two groups: (1) booster group (n = 150), vaccinated with Ingelvac MycoFLEX® at weaning and again at fattening start; and (2) one-dose group (n = 150), vaccinated only at weaning with the same vaccine. Tracheal catheter samples (PCR, pools of 5) and serum (ELISA) were collected at entry, and at 60 and 90 days of fattening. Body weights were recorded at the same time points. Coughing was monitored automatically, and lung lesions were scored at slaughter.

Results

At entry, both groups showed similar infection prevalence (1/30 positive pool per group) and body weights. At 60 days, infection increased in both groups, while weights remained comparable. At 90 days, nearly all pools were PCR-positive (89.7% booster vs. 100% one-dose), but booster pigs had significantly higher body weight (89.22 kg vs. 85.16 kg; $p = 0.018$). Least square mean carcass weights were 93.35 kg vs. 88.64 kg, respectively, with an average difference of ~5 kg ($p < 0.0001$).

Discussion and Conclusion

A booster vaccination at fattening start improved final body and carcass weights despite high infection pressure. These findings support booster strategies as a practical tool to enhance productivity in herds under natural M. hyopneumoniae infection conditions.

BBD-PP-08

RESPIRATORY PATHOGENS AND ANTIBIOTIC SUSCEPTIBILITY IN FINISHING PIGS SAMPLED AT SLAUGHTER

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Background and Objectives

Respiratory disease is common in finishers and causes production losses, including reduced growth, death, or carcass condemnation at slaughter. Several agents interact in the porcine respiratory disease complex. This study aimed to gain more knowledge about respiratory disease pathogens in Swedish pigs and to investigate antibiotic susceptibility of detected bacterial pathogens.

Material and Methods

Heart and lungs showing acute hemorrhagic, necrotic, or adhesive lesions were swab-sampled at slaughter and analyzed by PCR for: Actinobacillus pleuropneumoniae, swine influenza virus, Mesomycoplasma hyopneumoniae, Mesomycoplasma hyorhinis, and Pasteurella multocida. Swabs were also cultured for A. pleuropneumoniae, Pasteurellaceae, and Streptococcus suis. Susceptibility testing was performed by microdilution for penicillin, trimetoprim/sulphametoxazol, tetracycline, enrofloxacin, florfenicol, gamitromycin, and ampicillin; additionally, ceftiofur for Pasteurellaceae, and cefalexin, oxacillin, cefoxitin, fusidic acid, erytromycin, and clindamycin for staphylococci and streptococci.

Results

A total of 69 samples were collected from 19 herds. On individual[i] and herd[h] level, in descending order, A. pleuropneumoniae (n=33[i], 10[h]), P. multocida (n=15[i], 8[h]), M. hyopneumoniae (n=12[i], 7[h]), swine influenza virus (n=4[i], 2[h]) and M. hyorhinis (n=1[i], 1[h]) were detected by PCR. The most common combinations were A. pleuropneumoniae+ P. multocida, A. pleuropneumoniae+ M. hyopneumoniae, or all three. Cultures were positive for A. pleuropneumoniae (n=23), P. multocida (n=14), and Streptococcus suis (n=1). Staphylococcus aureus susceptible to methicillin was detected in seven cultures. All isolates of A. pleuropneumoniae and P. multocida were susceptible to all antibiotics tested. The Streptococcus suis isolate was susceptible to penicillin.

Discussion and Conclusion

Analyzing swab samples collected at slaughter can be an effective way of monitoring respiratory disease in pigs and gaining knowledge about antibiotic susceptibility of common bacterial pathogens at a national level. However, the risk of contamination and/or infection during transport and lairage should be considered. In this study, A. pleuropneumoniae, P. multocida, and M. hyopneumoniae were the most commonly detected respiratory pathogens, often found together.

BBD-PP-09

DETECTION OF APXII-TOXIN ANTIBODIES IN A NEGATIVE ACTINOBACILLUS PLEUROPNEUMONIAE FARM

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Background and Objectives

Swine pleuropneumonia is caused by Actinobacillus pleuropneumoniae (App) through different toxins and other virulence factors. ApxI-III toxins are considered the most relevant virulence factors of this pathogen. ApxIV is mainly used for diagnostic purposes.The objective of this work was to determine in a negative herd the presence of antibodies against the different Apx toxins, given that ApxI-III are non-App specific, while ApxIV has been described as App-specific.

Material and Methods

In a negative commercial farm, 42 piglets were randomly selected and ear tagged. Serum samples were taken in the 4th and 10th weeks of life. Samples were analyzed through four enzyme-linked immunosorbent assay (ELISA) tests against Apx toxins I, II, III (in-house ELISA), and IV (IDEXX APP-ApxIV Ab (Idexx, USA)), expressing the results in S/P value and positive frequency (%).

Results

In S/P ratio, at 4 weeks of life were detected the following values for ApxI: 0.000 (IC95%= 0.000 – 0.000), ApxII: 0.416 (IC95%=0.229 – 0.604), ApxIII: 0.007 (IC95%= 0.001 – 0.013), and ApxIV: 0.002 (IC95%=0.000 – 0.006).At 10 weeks of life were detected the following values for ApxI: 0.011 (IC95%= 0.000 – 0.021), ApxII: 0.596 (IC95%=0.365 – 0.827), ApxIII: 0.038 (IC95%= 0.011 – 0.064), and ApxIV: 0.011 (IC95%=0.000 – 0.025).All animals were considered to be negative for Apx-I, -III and -IV antibodies; however, 51.3% of samples resulted positive for ApxII-toxin antibodies.

Discussion and Conclusion

The negative results obtained for ApxIV-toxin antibodies in all samples classify the farm as being negative for App.However, the presence of high prevalence of ApxII-positive animals suggests that this farm could have been infected by other Apx toxin-producing bacteria, as Actinobacillus porcitonsillarum, given that it is the only known bacterium producing ApxII toxin without ApxI or III production.These results also suggest a low specificity of ApxI-III ELISAs to define the App status of a farm, given that the presence of other ApxI-III producing bacteria could show false-positive results.

BBD-PP-10

MONITORING MYCOPLASMA HYOPNEUMONIAE HERD STATUS DURING ELIMINATION

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Background and Objectives

Mycoplasma hyopneumoniae (M. hyopneumoniae) elimination continues to be successful using various programs with the ability to maintain a negative status downstream. Historically, eliminations were carried out on a time-basis, assuming that the herd would stop shedding with time. With improved diagnostics, veterinarians can utilize rigorous testing protocols and strategic medication timing to aid confidence. The objective of this case study was to highlight the timeline of testing and elimination practices throughout the closure.

Material and Methods

A closure and medication elimination protocol was implemented. Prior to closure, the farm underwent an M. hyopneumoniae acclimation program to aid uniform exposure and establish “Day 0”. Whole herd medication with Tulathromycin was completed 28 days after exposure following appropriate diagnostic confirmation. Early medication treatment was implemented to help shorten the time to produce negative offspring. During the closure, the youngest group of gilts and their offspring were longitudinally sampled to monitor their status and program success.

Results

The first group of pigs weaned after completion of whole-herd treatment remained clinically normal and tested PCR-negative using tracheal catheter samples. Additional sampling of wean-to-finish pigs also remained PCR-negative, with no observed clinical signs and good performance. The youngest gilt cohort was tested monthly beginning six months after exposure confirmation to compare over time. 6.7% of animals remained PCR-positive at 240 days post-exposure. As a result, an off-site breeding project was decided to extend the closure.

Discussion and Conclusion

This case study demonstrates the importance of continued monitoring of both the sow farm and downstream herds to ensure the success of the elimination program and its progress. It also highlights that flexibility is critical, particularly when outcomes do not align with expectations, requiring timely adaptation of the protocol.

BBD-PP-11

DETERMINING FACTORS EXPLAINING THE LARGE VARIATION OF THE VACCINATION EFFECT AGAINST MYCOPLASMA HYOPNEUMONIAE IN PIGS: A META-REGRESSION

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Background and Objectives

Mycoplasma hyopneumoniae (M. hyopneumoniae) is the etiologic agent of enzootic pneumonia. The control of M. hyopneumoniae primarily relies on commercially available inactivated bacterins. However, recent studies examining the impact of M. hyopneumoniae vaccination have produced conflicting results, possibly due to variations in experimental set-up, group size, co-infections, infection duration, and different types of vaccines administered. Therefore, this study aimed to conduct a meta-analysis to evaluate the effects of M. hyopneumoniae vaccination on ADWG and macroscopic lung lesion scores (LLS) in placebo-controlled studies involving fattening pigs affected by enzootic pneumonia.

Material and Methods

For the identification of relevant studies, two text-based search strategies were employed: “vaccine AND Mycoplasma hyopneumoniae AND pig” and “vaccine AND Mycoplasma hyopneumoniae AND swine”. After screening and eligibility evaluation, 24 and 25 studies remained to evaluate the vaccination effect respectively on ADGW and LLS.

Results

The meta-analysis results revealed a statistically significant intervention effect, showing a difference of 17.43 grams in ADWG (95% CI [9.88; 24.98], $P < 0.001$) among animals vaccinated against M. hyopneumoniae compared to control animals. The effect was observed to be smaller after a single vaccination (one shot strategy), with a difference of 11.66 grams (95% CI [4.55; 18.77]), compared to 28.97 grams (95% CI [10.30; 47.65]) following multiple vaccinations. This study characteristic also explained part of the variation of the treatment effect variation on ADWG. Vaccination against M. hyopneumoniae also led to a statistically significant difference in LLS equal to 7.78% (95% CI [3.67; 11.90], $P < 0.001$).

Discussion and Conclusion

In summary, this meta-analysis quantified the effectiveness of vaccination against Mycoplasma hyopneumoniae on ADWG and LLS in pigs and determined factors that are associated with the large effectiveness variation. Despite the significant positive effect of vaccination, it is rather small and the economic benefits of M. hyopneumoniae vaccination may depend on current market value of slaughter pigs.

BBD-PP-12

SUCCESSFUL MYCOPLASMA HYOPNEUMONIAE ERADICATION IN A MULTIPLIER HERD USING TRACHEO-BRONCHIAL SWAB MONITORING COMBINED WITH VACCINATION AND TREATMENT PROTOCOL

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Background and Objectives

Mycoplasma hyopneumoniae (M. hyo) occurs worldwide and causes major economic losses to the pig industry. Piglets become infected with M. hyo during the suckling period and have been shown positive from weaning onwards. Moreover, once infected with M. hyo, animals can excrete the pathogen over a long period of time (254 days post-infection). Therefore, dedicated programs to monitor for freedom of M. hyo have been developed consisting of serological screening and further confirmation tests using PCR. The objective of the case report was to describe a successful M. hyo eradication in a multiplier sow herd, using a combined program of vaccination and treatment while monitoring freedom of disease with tracheo-bronchial swab (TBS).

Material and Methods

A high health breeding farm (400-sow herd with internal breeding gilt facility) had been negative for M. hyo for 40 years using a standard serological monitoring schedule. After a suspected outbreak, M. hyo-positivity was confirmed with TBS, an eradication program was established combining an additional triple M. hyo one-shot vaccination (4-weeks interval) with a double individual injection of all pigs present on-farm with tulathromycin (2-weeks interval). Furthermore, a 2-weeks stop was introduced for breeding gilt replacement. Monitoring was carried out using TBS at 12 and 24 weeks after the second antimicrobial treatment to confirm M. hyo eradication in the herd.

Results

TBS sampling revealed several pools as M. hyo-positive in breeding sows in Q1 2025. Following the completion of the eradication protocol, including vaccination and treatment, no M. hyo-positive TBS samples could be detected at 10 weeks post-treatment in post-weaned piglets.

Discussion and Conclusion

The current case report demonstrated that M. hyo eradication is possible in a multiplier sow herd. Monitoring of M. hyo infection using TBS sampling in sows and piglets is a reliable diagnostic technique to confirm infection and follow-up the evolution towards freedom of disease.

BBD-PP-13

PROPOSAL OF A HISTOPATHOLOGICAL SCORING SYSTEM TO EVALUATE SEVERITY OF COLONIC LESIONS ASSOCIATED WITH EXPERIMENTAL SWINE DYSENTERY

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Background and Objectives

Swine dysentery remains a major constraint in modern pig production due to its substantial impact on animal health, welfare and productivity. The colon is a key target organ for this pathogen, yet consistent and practical tools for microscopic lesion assessment are limited. Standardized histological scoring is essential to improve diagnostic accuracy, support research studies and facilitate comparison across cases and experiments. The objective of this work was to design a simple, reproducible, useful and comprehensive scoring system to evaluate colonic microscopic lesions associated with swine dysentery.

Material and Methods

A histopathological score was created to assess four core components of colonic damage: (1) mucosa status (0–4), ranging from intact epithelium to ulceration; (2) lamina propria inflammatory infiltrate (0–4), reflecting severity and distribution; (3) crypt intraluminal infiltrate (0–4), including the presence of giant cells; and (4) additional features such as haemorrhages, presence of Balantidium coli and predominant inflammatory cell type. The system was designed to be applicable in both experimental and diagnostic settings, requiring only routine histological staining (haematoxylin and eosin) and examination at standard magnifications.

Results

The scoring system was evaluated using 40 pigs, including 30 animals experimentally challenged with Brachyspira hyodysenteriae. Challenged pigs exhibited markedly increased score in mucosa disruption, lamina propria infiltration and crypt-associated lesions. These findings coincided with the clinical signs of dysentery and the shedding of the pathogen in faeces. Control animals showed minimal or absent microscopic findings, supporting the sensitivity and specificity of the scoring system.

Discussion and Conclusion

This scoring system offers a practical and structured approach for assessing colonic lesions in pigs. By integrating epithelial damage, inflammatory patterns and additional pathological indicators, it provides valuable insight into lesion severity. While results from the experimental challenge support its utility, further validation in field outbreaks—where lesion variability and severity are often greater—is recommended to confirm its broader applicability.

BBD-PP-14

BACTERIAL ISOLATION FROM THE NASAL CAVITIES OF NEWBORN PIGLETS YIELDS A COLLECTION SIMILAR TO THAT OBTAINED FROM SOWS

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Background and Objectives

Respiratory infections are among the leading causes of mortality in pigs worldwide and result in significant economic losses for the swine industry. The nasal microbiota acts as the first line of defense in the respiratory system and it is well known that sow-piglet contact plays a critical role in the transfer and establishment of the microbiota. This study aimed to characterize the nasal microbiota of newborn piglets raised under antibiotic-free conditions.

Material and Methods

Samples were collected from four farrowing units from farms with satisfactory health status. Nasal swabs were obtained from ten sows per farm and two piglets per sow one day after birth. Vaginal swabs and colostrum samples were also collected from the same sows. All samples were processed for bacterial isolation on chocolate and MRS agar plates, and up to ten colonies per sample were selected for further analysis. A fragment corresponding to the V3-V4 hypervariable region of the 16S rRNA gene was amplified and sequenced for bacterial identification using BLAST.

Results

We obtained 814 isolates: 318 from piglet noses, 163 from sow noses, 173 from colostrum, and 160 from vaginal samples. The most abundant species in the collection was Rothia nasimurium, followed by Staphylococcus sp., Streptococcus pluranimalium and Streptococcus suis. Sow and piglet nasal samples were dominated by R. nasimurium and S. pluranimalium. In colostrum samples, R. nasimurium, Staphylococcus sp., S. pluranimalium and Enterococcus faecium were the most abundant, while S. suis, Escherichia coli and Streptococcus dysgalactiae predominated in vaginal samples. Piglet nasal samples exhibited the highest bacterial diversity, whereas vaginal samples showed the lowest.

Discussion and Conclusion

Nasal samples from piglets exhibited the highest bacterial diversity, whereas vaginal samples showed the lowest. Moreover, piglet nasal samples were more similar to sow nasal samples than to colostrum or vaginal samples.

BBD-PP-15

EX VIVO ASSESSMENT OF THE ANTIMICROBIAL CAPACITY OF GLYCERIDES OF LAURIC ACID AGAINST STREPTOCOCCUS SUIS USING GASTROINTESTINAL FLUIDS FROM PIGLETS

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Background and Objectives

Streptococcus suis remains one of the most challenging diseases in swine production. Effective vaccines are lacking and antibiotic-resistance is emerging, indicating the need for alternative solutions to prevent disease. Glycerides of lauric acid have shown potent antibacterial activity in vitro against gram-positive bacteria, but in vivo confirmation remains challenging. To address this gap, we developed an ex vivo antimicrobial assessment using gastrointestinal fluids and applied it to evaluate activity against S. suis in GC12-supplemented piglets.

Material and Methods

Twelve weaned piglets received a commercial diet for 50 days. Six piglets were supplemented with a source of GC12 (FRA® C12 Dry) at 4kg/ton during the first 11 days and 3kg/ton until D50. Intestinal content from ileum, distal colon and rectum was collected and digestive fluids were extracted to test antibacterial activity against S. suis with a minimal concentration inhibition test (1:1 to 1:5 dilution). Pearson's X^2 test was applied to test differences between the groups in growth inhibition capacities towards S. suis.

Results

Antibacterial activity was only observed with dilution 1:1. S. suis was inhibited in 83% of the ileal samples from piglets receiving GC12 (P=0.021), in 67% of the distal colon samples (P=0.079) and in 60% of the rectal samples (P=0.527), while from non-supplemented samples inhibition was shown only in 17% of the samples of both ileum and distal colon and in 40% of the rectal samples.

Discussion and Conclusion

The gastrointestinal tract is identified as a potential route of infection in piglets, as the intestines of piglets are rapidly colonized by S. suis which is a source of sepsis. With this ex vivo antibacterial assessment, supplementation of GC12 showed antibacterial activity in the intestinal fluid which can reduce the intestinal colonization in vivo. This suggests that GC12 can be a promising solution to protect piglets against disease.

BBD-PP-16

INSIGHTS INTO AN OUTBREAK OF SWINE DYSENTERY ON A NAÏVE FARM INVOLVING A STRAIN OF B. HYODYSENTERIAE WITH LOW SUSCEPTIBILITY.

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Background and Objectives

This study summarises the hallmarks of a field study with intensive monitoring for two and a half months, on a farm with an outbreak of swine dysentery (B. hyodysenteriae) on a farrow-to-finish farm (800 Iberian sows) with no previous history of the disease. The aim of the study was to understand how the pathogen spreads on naive herds, understanding the flaws on antibiotherapy with pan-resistant strains and finally characterise the mother to piglet transmission, which is a rare event.

Material and Methods

Eighteen sows (13 infected by B. hyo and 5 non-infected) were monitored in the gestation unit (4-6 samplings). Additionally, in the farrowing room, 5 infected sows and their litters (16 piglets in total, 12 with SD and 4 negative pigs) were monitored in farrowing and weaning stages. B. hyodysenteriae shedding in faeces was quantified in all samples by qPCR.

Results

Both sows with clinical signs and with no clinical disease shed large amounts of Brachyspira which infected piglets vertically. These animals amplified the infection in later stages (after weaning). The low susceptibility of the strain to antimicrobials reduced the treatments (tiamulin and lincomycin) efficacy both in sows and piglets, sometimes limiting the clinical signs but not the pathogen excretion. The results of the study reveal relevant insights about the dynamics and weak points in a swine dysentery outbreak on a naïve farm. Current research on samples collected are elucidating the role of other enteric pathogens (Lawsonia and Salmonella) in the outbreak and also in the interaction of B. hyodysenteriae and the intestinal microbiota.

Discussion and Conclusion

The study evidences the current problematic of swine dysentery and the role of adults with no clinical disease in the spread of the infection. In addition, it reports an uncommon disease outcome in the lactation period.

BBD-PP-17

ACTINOBACILLUS PLEUROPNEUMIONIAE TRANSMISSION ON MULTIPLYING FARMS – AN ORIENTATIONAL STUDY

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Background and Objectives

The objective of this study is getting more insights about the extent of App transmission: from sows to their offspring, between piglets in the nurseries, including possible risk-factors such parity and absence of App specific maternally derived antibodies.

Material and Methods

On 2 farms (A, B),3-4 gilts and 6-7 sows were sampled, including 1 (different) piglet per litter at 3,5,7,9,11,13 weeks of life.
Tonsillar scrapes were tested for App by qPCR.
Serum samples were tested via an App-ApxIV ELISA.
Farm history: A:no vaccination and no clinical problems. B:gilt vaccination/sometimes App associated problems in nursery.

Results

Farm A:App prevalences
qPCR: Gilt: 100% + piglet 3w: 25% / Sow: 100% + piglet 3w: 50% / 5w:100% / 7w: 60% / 9w: 30% / 11w: 100% / 13w: 90%
ELISA: Gilt: 50% + piglet 3w: 25% / Sow:100% + piglet 3w:100% / 5w: 70% / 7w: 70% / 9w: 10% / 11w: 0% / 13w: 10%

Farm B:App prevalences
qPCR: Gilt: 100% + piglet 3w: 33% / Sow: 86% + piglet 3w: 86% / 5w:70% / 7w: 70% / 9w: 100% / 11w: 90% / 13w: 100%
ELISA Gilt: 100% + piglet 3w: 100% / Sow:100% + piglet 3w:100% / 5w: 80% / 7w: 50% / 9w: 70% / 11w: 100% / 13w: 80%

Discussion and Conclusion

No relevant difference seen in App-qPCR prevalence between sows and gilts on both farms.
A high proportion of suckling piglets is colonized, continuously increasing among pen-mates till around 100% in finishing.
Transmission from gilts towards their offspring was surprisingly less than of sows on both farms.
No relation between ApxIV positivity and transmission was found. Suckling piglets still get colonized while having MDA's and in both farms the qPCR nursery prevalence increased while in Farm A the ApxIV antibodies dropped to negative values vs an increase on Farm B. Therefore, it's interesting to perform a follow up study for the correlation between ApxIV titers and protective App antibody levels in a longitudinal study on App non-colonized and colonized piglets.

BBD-PP-18

CONCURRENT SALMONELLA CHOLERAESUIS AND SALMONELLA TYPHIMURIUM INFECTIONS IN A NURSERY IN GERMANY

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Background and Objectives

Salmonella spp. are major zoonotic pathogens in swine production, impacting pig health through enteric and systemic infections while also posing a public health risk through the food chain. S. Typhimurium (STM) is typically associated with enteritis and carrier states, while S. Choleraesuis (SCS)—a host-adapted serovar in pigs—can lead to severe septicaemia, respiratory signs, and high mortality. This case report describes the detection of SCS in a piglet nursery with a history of respiratory disease and persistent STM infection.

Material and Methods

The affected nursery housed 4,500 piglets with spot-mix feeding, microclimate zones and underfloor air extraction. Piglets were frequently delivered from three different origins. In each group clinical signs appeared during mid-nursery, characterized with respiratory signs affecting the whole batch, linked firstly to swIAV. Some batches showed yellowish diarrhoea in individual animals. In the affected batch in October 2025 additionally cyanotic pigs, and increased mortality appeared. In necropsy lung samples (frour animals) were tested via PCR on PRRSV1/-2, swIAV, M.hyo, PCV2 and STM/SCS. Gut swabs from animals with lesions were investigated for Salmonella in culture and by PCR on STM/SCS and Brachyspira (B.).

Results

Macroscopic EP- like lung lesions and diphtheroid deposits in the cecum and fibrin admixtures in the colon lumen could be observed. Pool samples were positive on B. pilosicoli and PRRS-1 field virus. STM was detected in the gut swabs via culture but investigated by PCR they were additionally positive for SCS. In all lungs SCS was found by PCR. Stored lung samples from previous necropsies, retrospectively investigated by PCR were also positive for SCS.

Discussion and Conclusion

In this case, without SCS PCR, respiratory clinical signs would only have been linked to either swIAV or PRRSV and implementing measures against those pathogens might not have led to satisfying results. If STM is additionally present, the diagnose can be difficult without PCR, as STM can overgrow.

BBD-PP-19

THE POSITIVE EFFECT OF YEAST DERIVED BETA-GLUCANS IN MITIGATING THE NEGATIVE IMPACT OF LAWSONIA INTERACELLULARIS IN EXPERIMENTALLY CHALLENGED GROWING PIGS

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Background and Objectives

Lawsonia intracellularis, an obligate intracellular bacterium, causes porcine proliferative enteropathy by infecting the porcine small intestine, impairing growth and negatively impacting health. Beta-glucans (BG) are non-starch polysaccharides with ®-(1,3/1,6)-linked glucose monomers that modulate immunity by interacting with innate immune cells. This study evaluated whether dietary supplementation with a yeast-derived BG (Safglucan®, Phileo by Lesaffre) could mitigate the adverse effects of L. intracellularis infection in weaned pigs.

Material and Methods

Ninety-six L. intracellularis-negative weaned piglets were randomly allocated to two groups (12 pens/group, four pigs/pen) receiving basal diets without or with 250 g/ton BG from days 0–28 (Phase 1). On day 28, all pigs were orally challenged with 10^7 L. intracellularis and continued on Phase 2 diets with or without BG through day 49. Body weight, feed intake, and rectal temperature were recorded throughout. Fecal samples underwent qPCR for bacterial shedding; blood samples were analyzed for antibody titers. At necropsy (day 49), intestinal tissues were collected for histopathology and immunohistochemistry to assess lesion severity and bacterial colonization.

Results

Supplementation with yeast-derived BG increased average daily gain (680g vs 650 g; $p<0.05$), decreased feed conversion ratio (2.02 vs 2.14; $p<0.05$), improved feed efficiency (0.5 vs 0.47; $p<0.05$), and reduced intestinal lesion severity score (7.81 vs 37.75; $p<0.01$) compared to controls during the post-challenge period. There was no significant difference in IHC scoring and seroconversion, but antibody titers were significantly lower in the BG group ($p=0.042$). However, Lawsonia fecal shedding was higher in the BG group (log12.51 vs log11.21; $p<0.05$).

Discussion and Conclusion

Dietary supplementation of pig diets with yeast-derived betaglucans mitigated the negative impacts of L. intracellularis infection, improving pig performance, and decreasing intestinal pathology, despite the higher fecal shedding observed. The beneficial effects may be attributed to the positive impact of betaglucans on gut health, leading to improved nutrient digestibility and utilization.

BBD-PP-20

NOVEL PREVALENCE CHARACTERISTICS OF VT2E TOXIN GENE IN ALL AGE GROUPS AND RESPECTIVE RISK FACTORS IN GREEK SWINE FARMS

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Background and Objectives

Oedema disease (OD), caused by Verotoxin-producing strains of Escherichia Coli (VTEC), is characterized by significant health effects often at the post-weaning age, with neurological signs, oedema at various tissues and sudden death. The aim of the present study was to assess the novel prevalence characteristics of Vt2e toxin gene in oral fluid samples and evaluate respective risk factors in Greek swine farms.

Material and Methods

A questionnaire survey, including 29 health and management factors, was performed in 32 farrow-to-finish farms, representing > 30% of the national pig census, whereas oral fluid samples were collected with the rope method (Verocheck oral fluids sampling system) from three different age groups, i.e. three samples per age group at 4-6, 10-12 and 15-18 weeks of age. A qPCR was performed for the detection of Vt2e toxin gene of E. coli, in the total of 288 samples.

Results

The 117 samples (40.6%) were positive for the VT2e toxin gene, of which 39 with Ct value <35. Approximately 17.7% at 4-week, 46.9% at 10-12-week and 57.3% at 15-18-week samples were positive. A higher proportion of positive samples were detected in smaller (< 200 sows) than larger (>300 sows) farms (54.2% Vs 34.6%). Several factors were associated with either an increase (i.e. greater number of weaned pigs/sow/year (p=0.014), higher density at fattening (p=0.001), higher feed protein levels at fattening (p=0.002)], or a decrease [e.g. antimicrobial usage (p=0.008)] of the VTEC strains prevalence.

Discussion and Conclusion

Results suggested that the absence of therapeutic or preventive measures during the fattening stage provides room for further spread of VTEC strains across different age groups and increases VTEC persistence at the farm level. Furthermore, since there was absence of typical OD clinical signs in the tested farms, results support further research on the subclinical Verotoxin effect across all age groups and its prevention.

BBD-PP-21

PREVALENCE, LEVEL AND CORRELATION BETWEEN LAWSONIA INTRACELLULARIS AND BRACHYSPIRA PILOSICOLI IN DANISH WEANERS

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Background and Objectives

Within-herd infection dynamics of Lawsonia intracellularis (LI) and Brachyspira pilosicoli (BP) can be affected by many factors. Since the last published prevalence study in Danish herds from 2019/2020, use of ZnO at weaning has stopped, and LI vaccination rates have tripled. The aim of this study was therefore to obtain an updated overview of prevalence, levels and correlation of LI and BP in Danish nursery farms not vaccinating against LI.

Material and Methods

Between September 2024 and May 2025, pooled fecal samples were collected from pigs at 3-, 5-, and 7-weeks post-weaning from each of 52 Danish farms. Samples were analyzed for LI and BP by qPCR at MSD Animal Health R&D Service Laboratory, The Netherlands. Results were reported as $\log_{10}$ DNA copies/µL of fecal solute, and as quantification cycle (Cq) values, respectively.

Results

At 3-, 5-, and 7-weeks post-weaning, the prevalence of LI was 11.5%, 44.0%, and 52.0%, while the prevalence of BP was 30.7%, 40.0%, and 50.0%, respectively. The mean infection levels in LI-positive samples were 2.4 (median and range: 2.2; 1.4-4.4); 2.3 (2.4; 0.5-4.4) and 3.1 (3.2; 0.5-5.3) $\log_{10}$ copies/µL, and for BP-positive samples 29.6 (29.1; 34.9-21.9), 27.6 (26.6; 34.7-21.4) and 27.0 (27.0; 34.7-20.9) Cq-values at the respective time points. In samples positive for both pathogens, Pearson's correlation coefficients between LI and BP levels were-0.45 (p=0.066) and -0.52 (p=0.028) at 5-, and 7-weeks post-weaning, respectively.

Discussion and Conclusion

Compared to previously published results (2019-2022), the prevalence of LI in non-vaccinating nurseries appears reduced, but levels in positive herds continue to be at production-impacting levels. Also, occurrence in finishers remains to be evaluated. Notably, BP was detected at relatively high prevalence just 3-weeks post-weaning, indicating early infection onset. Further, this study supports that with LI and BP co-infection, the two pathogens appear to potentiate each other.

BBD-PP-22

A CASE OF A SEPTICAEMIC PASTEURELLA MULTOCIDA OUTBREAK IN A SOW HERD IN GERMANY

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Background and Objectives

Pasteurella multocida (PM) in pigs is classified into five capsular serogroups (A, B, D, E, F). Toxigenic types A and D cause progressive atrophic rhinitis, while non-toxigenic strains are major contributors to the Porcine Respiratory Disease Complex (PRDC). Sporadic outbreaks of haemorrhagic septicaemia due to PM types B and D have also been reported. This case describes such an outbreak in Germany.

Material and Methods

In January 2021, a newly built 2,500-sow farm was stocked with high-health gilts (PRRSV- and APP-free) at various gestation stages. The first farrowing occurred in March. In April, 14 late-gestation sows died suddenly, showing neurological signs and cyanosis of ears or abdomen. Less affected animals exhibited laboured breathing, sneezing, and sniffing. In total, 49 sows died. Nine acute dead, untreated sows, were submitted for necropsy, in particular to rule out ASF and CSF. All other sows received oral amoxicillin; severely affected animals additionally received enrofloxacin injections. Blood samples were tested by ELISA (PRRSV, Influenza, PCV2, G. parasuis, A. pleuropneumoniae, Leptospira, Chlamydia) and PCR (PRRSV, Influenza, PCV2, E. rhusiopathiae).

Results

Serology and PCR were negative for all tested pathogens. Necropsy revealed reddened nasal mucosa, fibrinous pleuritis, fibrinous to purulent peritonitis, and enlarged liver and spleen; kidneys appeared normal. Bacteriology confirmed non-toxigenic PM capsular types A and D in all affected organs, leading to a diagnosis of septicaemic pasteurellosis.

Discussion and Conclusion

This case underscores the importance of thorough necropsy and bacteriology in sudden sow mortality. Combining clinical, pathological, and microbiological findings was essential for diagnosis. All isolates were preserved for potential autogenous vaccine production.

BBD-PP-23

A THYMOL-BASED BOTANICAL BLEND REDUCES LPS-INDUCED INFLAMMATION AND PRESERVES BARRIER INTEGRITY IN PORCINE INTESTINAL MODELS

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Background and Objectives

Intestinal inflammation can disrupt intestinal barrier in pigs, leading to reduced performance and increased disease susceptibility. Evaluating botanical interventions requires both screening efficiency and an in-depth understanding of their modes of action. This study investigated whether AviPower®5, a thymol-based botanical blend (BOT), could mitigate inflammatory-induced barrier dysfunction using IPEC-J2 cells as a screening model, with subsequent validation and characterization in apical-out porcine enteroids.

Material and Methods

IPEC-J2 cells were challenged for 24 hours with lipopolysaccharide form E. coli O55:B5 (LPS) and porcine pro-inflammatory cytokines in the presence or absence of BOT supplementation, and transepithelial electrical resistance (TEER) was monitored over eight days to assess barrier function. Following that, apical-out porcine enteroids were generated from jejunal crypts of 35-day-old pigs using EDTA isolation and suspension culture. Enteroids were challenged with LPS for six hours with or without BOT, and paracellular permeability (FD4 assay), inflammatory marker, and tight junction protein mRNA levels were quantified to elucidate underlying mechanisms.

Results

In IPEC-J2 cells, BOT treatment maintained significantly higher TEER values throughout the post-challenge period, achieving complete recovery by day eight, when control was still at 84% of initial value, indicating sustained barrier protection with BOT ($p<0.05$). When performed on enteroids, LPS challenge increased FD4 permeability by 70% and upregulated IL1®, IL6, IL8, and MUC4 two-fold ($p<0.01$). In tight junction proteins occludin decreased significantly ($p<0.05$). Botanical supplementation reduced permeability by 35% ($p<0.05$), significantly decreased all inflammatory markers, and increased ZO1 and occludin expression by 50% ($p<0.05$).

Discussion and Conclusion

AviPower®5 demonstrated consistent barrier-protective effects across different porcine intestinal models. Analysis in enteroids revealed preservation of tight junction integrity and attenuation of inflammatory cytokine responses as key protective mechanisms. This botanical blend shows strong potential as a nutritional strategy to enhance intestinal resilience during stressful production phases, offering a promising solution for commercial pig farming.

Cod:

BBD-PP-24

THE SUPPLEMENTATION OF BUTYRATE GLYCERIDES IN FEED IMPROVES PIGLETS' RESILIENCE TO ETEC-INDUCED POST-WEANING SYNDROME

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Background and Objectives

Post-weaning syndrome (PWS) caused by enterotoxigenic Escherichia coli (ETEC) remains a major challenge in pig production, causing impaired growth, mortality and important economic losses. Butyrate glycerides (BG) have shown potential benefits in gut health and promising antimicrobial properties. This study aims to evaluate the efficacy of BG supplementation to enhance piglet resilience against ETEC-induced PWS.

Material and Methods

Fifty-four weaned male piglets (body weight ~6.3kg) genotyped as ETEC-F18-sensitive were allocated into three groups: Control (CTRL), Challenged (Chall), and Challenged BG-supplemented (2kg/T). The Challenged groups were orally inoculated with 10^8 CFU/piglet of ETEC F18 serogroup O141:K94, on day 28 of age. The trial lasted four weeks. Zootechnical performances, survival, fecal scores (FS) and salivary biomarkers of inflammation, stress and immunity were monitored. IgG levels were measured in the serum and E. coli counts were assessed in the feces.

Results

The F18-ETEC Challenge reduced survival (88.9%) and impaired performances, with a 67.4% decrease in average daily gain (68 vs. 209 g/day, $P < 0.01$) during the first week post-challenge. BG supplementation significantly mitigated these effects, restoring 70% of daily gain (168 g/day, $P < 0.05$) and 88.9% of feed efficiency (0.53 vs. 0.21 Gain/Feed ratio, $P < 0.05$). Mortality dropped to 5.6% and diarrhea severity (FS) was significantly reduced (–46%, $P < 0.05$) in BG-supplemented group. Biomarker analysis revealed lower inflammatory protein S100A12 ($P < 0.05$), ⟨-amylase pain marker ($P < 0.05$) and oxidative stress index ($P < 0.05$) in BG-supplemented group. Notably, IgG levels were significantly increased compared to both CTRL and Chall groups ($P < 0.01$) indicating enhanced humoral response.

Discussion and Conclusion

Butyrate glycerides supplementation improved piglet resilience to ETEC-induced PWS by reducing mortality, diarrhea severity and stress while restoring growth performances and enhancing immune competence. These findings support its use as a nutritional strategy to improve health and productivity during critical phases such as post-weaning.

BBD-PP-25

CHARACTERISATION AND PHYSIOLOGICAL IMPACTS OF THE WILD SWINE MICROBIOTA

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Background and Objectives

The gut microbiota serves a crucial role in swine health, providing its host with key metabolites, priming the immune system, and protecting against pathogens. Yet, the standard commercial pig lives in very different conditions to its wild ancestor, the host with which the microbiota co-evolved. Previous studies have indicated wild boar to have different microbiotas to commercial pigs, but little was known about its physiological effects. We aimed to compare the microbiota of farmed pigs to wild boar, and understand the potential physiological and immunological implications.

Material and Methods

Samples were collected from farmed pigs (90 days of age) and wild boar (post-juveniles) hunted in the Belgian forest (n = 14 per group, equal males and females with no pregnancies). V1-V9 16S rRNA sequencing was performed of the ileal and faecal microbiota. Ileal, colonic, and faecal volatile fatty acids were quantified via gas chromatography, and high throughput qPCR was performed to analyse gene expression in the spleen.

Results

The ileal microbiota was shown to have significantly higher ⟨-diversity in the farmed pigs, and was dominated by Lactobacillus, compared to that of the wild boar which was dominated by Streptococcus. In contrast, the wild boar had significantly higher ⟨-diversity in the faeces, alongside enriched Prevotellaceae, Lachnospiraceae, and Faecalibacterium. Short-chain fatty acids were significantly higher in the digesta and faeces of the wild boar. Expression of innate immune and Th2-response-related genes was upregulated in the wild group compared to farmed pigs.

Discussion and Conclusion

We present a complex picture of the wild microbiota and its physiological implications. Increased faecal diversity and short-chain fatty acids suggest a beneficial role of the wild microbiota for health, yet this is contradicted by increased immune responses in the wild environment. Given the starkly different microbial composition, this work highlights future avenues to explore to improve the microbiota of commercially-reared pigs.

BBD-PP-26

SUCCESSFUL BRACHYSPIRA HYODYSENTERIAE ERADICATION THROUGH A COMBINED APPROACH OF A ZINC CHELATE TREATMENT AND ADAPTED MANAGEMENT MEASURES

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Background and Objectives

Brachyspira hyodysenteriae (B. hyodysenteriae) is the primary cause of swine dysentery, characterized by bloody to mucoid diarrhea due to mucohaemorhagic colitis in pigs. A worldwide re-emergence of isolates with decreased antimicrobial susceptibility has occurred. This compromises the possibilities to eradicate B. hyodysenteriae from infected pig farms. A novel non-antibiotic zinc chelate has been reported to demonstrate positive effects on clinical signs and B. hyodysenteriae excretion after a 6-day oral treatment. The objective was to evaluate the zinc chelate (IntraDysovinol® 499 mg/ml; IntraCare) within an eradication schedule with naturally occurring swine dysentery due to B. hyodysenteriae resistant to pleuromutilins under field conditions in Belgium.

Material and Methods

We evaluated a 14-day treatment schedule combined with alternative management measures (including partial depopulation of post-weaning facilities and improved external and internal biosecurity measures) and thorough cleaning and disinfection (including 2% NaOH) of the buildings and the sows from day 7 of treatment onwards. This alternative approach for B. hyodysenteriae eradication was evaluated on 18 swine farms (15 farrow-to-finish with 150-800 sows, 3 finishing with 1000-2500 pigs) over a 5-year period. The farms were confirmed with resistant B. hyodysenteriae strains. All enrolled eradication programs were evaluated through fecal sampling (n = 36-42) and PCR testing at least 6-9 months after the eradication.

Results

All enrolled farms in the field study tested B. hyodysenteriae negative at 6-9 months after the finalization of the eradication procedure. No clinical signs of B. hyodysenteriae were observed and no positive culture or PCR result was obtained following eradication.

Discussion and Conclusion

In conclusion, the Zn-chelate product has an excellent potential for application within an eradication protocol of B. hyodysenteriae resistant to pleuromutilins. The combined approach of Zn-chelate treatment and alternative management measures demonstrated to be successful in the eradication of farrow-to-wean, farrow-to-finish and finishing swine farms.

BBD-PP-27

FIRST EPIDEMIOLOGICAL STUDY OF POLYSEROSITIS-ASSOCIATED PATHOGENS IN PERUVIAN SWINE FARMS

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Background and Objectives

Glaesserella parasuis (GP) is an early colonizer of the upper respiratory tract in pigs. Although initially commensal, it is a primary pathogen within the polyserositis complex and the causative agent of Glässer's disease. The etiology of polyserositis is multifactorial, typically involving four bacterial agents: Glaesserella parasuis, Streptococcus suis, Mycoplasma hyorhinis and Mycoplasma hyosinoviae. Understanding the interactions among these pathogens is essential for accurate diagnosis and effective control strategies.This study aimed to assess, for the first time, the prevalence of GP and identify the most frequent coinfections on Peruvian swine farms.

Material and Methods

A total of 221 samples were collected from piglets showing clinical signs consistent with polyserositis. Sampling was conducted by HIPRA Technical Services between October 2018 and October 2025 across Peruvian swine farms distributed for all the national geography. Necropsy samples were obtained using sterile cotton swabs from pleura, pericardium, peritoneum, joints, and brain, and transferred to FTA cards for molecular analysis.Two diagnostic methods were employed: Glässercheck® (HIPRA), a PCR-based test for G. parasuis (N = 90), and Glässercheck® PLUS (HIPRA), a multiplex real-time PCR for simultaneous detection of Glaesserella parasuis, Streptococcus suis, M. hyorhinis, and M. hyosinoviae (N = 131).

Results

Overall, 68.78% of samples (221 samples) tested positive for GP. Among the multiplex-tested samples, coinfections were common, present in 131 samples, with the most frequent combination being G. parasuis + S. suis (69%, 90 samples).

Discussion and Conclusion

These findings reveal a high prevalence of GP in Peruvian farms with clinical signs of polyserositis and represent the first scientific report on this topic in the region. The frequent coinfections, especially with Streptococcus suis underscore the complexity of polyserositis diagnosis and the need for integrated diagnostic approaches often making the implementation of control strategies frustrating. Preventive strategies, particularly vaccination, may help reduce antibiotic consumption and improve disease control.

BBD-PP-28

STREPTOCOCCUS COMMUNITY IN THE FARROWING SOWS AND THEIR PIGLETS

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Background and Objectives

Previous studies have shown that the genus Streptococcus represents one of the dominant members of the porcine nasal microbiota and may be associated with respiratory disease. This study therefore aimed to characterize nasal Streptococcus isolates using ERIC-PCR fingerprinting, biofilm formation assays, and antimicrobial susceptibility testing.

Material and Methods

Samples were obtained from four farrowing units with good overall health status. Nasal swabs were collected from ten sows per farm and from two piglets per sow at one day of age. Vaginal swabs and colostrum samples were taken from the same sows. Samples were subjected to bacterial isolation on agar plates, and up to ten colonies from each sample were picked for downstream analyses. A fragment of the 16S rRNA gene was amplified and sequenced. Bacterial identification was done using BLAST analysis. ERIC-PCR, biofilm formation assays, and antimicrobial susceptibility testing were performed to characterize strain diversity and phenotype.

Results

From the 814 bacterial isolates obtained, 307 (37.7%) were identified as Streptococcus, which included 17 different species. Streptococcus pluranimalium predominated in piglet and sow nasal samples and in colostrum, whereas vaginal samples were dominated by Streptococcus suis. ERIC-PCR revealed high genetic diversity in some species, with S. pluranimalium (n=79), Streptococcus hyovaginalis (n=44) and Streptococcus dysgalactiae (n=36) clustering into 47, 23 and 20 genotypes, respectively. Biofilm assays showed strong formation in S. pluranimalium, moderate and strain-dependent levels in S. dysgalactiae, and overall weak formation in Streptococcus thoraltensis and S. hyovaginalis. Antimicrobial susceptibility testing demonstrated that most isolates were susceptible to ®-lactams, tetracyclines, aminoglycosides, macrolides and fluoroquinolones.

Discussion and Conclusion

Further studies to characterize the different Streptococcus species identified are needed to understand their role in health and disease.

BBD-PP-29

EPIDEMIOLOGICAL UPDATE ON THE PREVALENCE OF ACTINOBACILLUS PLEUROPNEUMONIAE SEROTYPES IN SPAIN

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Background and Objectives

The objective of this study was to broaden current knowledge on Actinobacillus pleuropneumoniae (APP) serotypes involved in clinical cases in Spain and to evaluate their possible temporal evolution.

Material and Methods

A total of 492 Actinobacillus pleuropneumoniae isolates from retrospective clinical cases between January 2023 to September 2025 were processed in six diagnostic laboratories situated in different geographic areas of Spain. Serotyping was performed on 288 isolates, via serotype-specific PCR The seasonal frequency of cases, the most common serotypes and their development over time were examined in comparison with previous data from 2017 to 2022 (same systematic).

Results

Clinical cases of App were detected every month of the year, although winter and spring were the seasons in which prevalence of cases was higher (41% and 32% respectively).The most prevalent serotypes found were 9/11 (24%), 2 (19%), 17 (17%) and 5 (10%), and were found equally all around the country. The less prevalent serotypes found were 12 (0.4%), 18 (0.7%), 6 (1%), and 10 (1.7%). This data differs from previous data, where most prevalent serotypes were 2 (16%), 9/11 (14%), 4 (14%) and 10 (14%). The only serotypes not found were 1, 3, 14, 15 and 16. These data partially coincide with previous years' findings, when the only serotypes not found were 1, 12, 14, 15 and 16.

Discussion and Conclusion

The results of this retrospective study demonstrate that most App serotypes circulate in Spain and are connected to clinical disease. Of note is the increase in serotype 17, which has become one of the most prevalent ones.

BBD-PP-30

GENOMIC CHARACTERIZATION OF GLAESSERELLA PARASUIS FROM DISEASED PIGS IN PERU: INSIGHTS INTO DIVERSITY, VIRULENCE AND ANTIMICROBIAL RESISTANCE

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Background and Objectives

Glaesserella parasuis is a major swine pathogen responsible for Glässer's disease with global economic impact. The characterization of the genetic diversity and virulence of this bacterium have been conducted mainly in isolates from developed countries, while South American isolates remain underrepresented. To address this gap, we sequenced and characterized G. parasuis isolates circulating in Peru to gain insights into their diversity, virulence and antimicrobial resistance.

Material and Methods

Seventeen G. parasuis were isolated from pigs with Glässer's disease across nine farms. Genomic DNA was extracted using a commercial kit (IDEXX Laboratories, USA). DNA Library was prepared using the Native Barcoding Kit 24 V14 (Oxford Nanopore, UK) and sequencing was performed on the MinION Mk1C with R10.4 flow cells. Genome assembly was performed using Autocycler and Medaka to obtain high quality genomes. Phylogenetic analysis was performed with Parsnp-v2 and antimicrobial resistance genes (ARGs) and virulence factors were predicted with the ABRicate tool.

Results

We identified seven sequence types (STs) and five serotypes (2, 4, 6, 7 and 12) among 17 sequenced G. parasuis isolates, with ST454 (serotype 7) being the most prevalent across farms. Most isolates lacked ARGs; however, one isolate carried nine (aac(3)-IV, aph(3'')-Ia, aph(3'')-Ib, sul2, blaROB-1, tetB, lnuH, estT and floR) and tandem repeats of estT and floR genes. We also identified two coexisting small plasmids harbouring tetH, estT and blaROB-1 in two isolates. Most of the isolates presented at least one group 1 vtaA virulence gene. Genomic diversity was segregated into two clades (C1 and C2) based on phylogenetic and gene content analyses.

Discussion and Conclusion

Our results suggest a high diversity of G. parasuis in Peru, the presence of mobile elements carrying multiple ARGs and virulence factors underscores the need for continuous surveillance of this pathogen within the Peruvian swine industry to identify potential vaccine candidates.

BBD-PP-31

SEROTYPE DISTRIBUTION AND ANTIMICROBIAL RESISTANCE PATTERN OF ACTINOBACILLUS PLEUROPNEUMONIAE ISOLATES COLLECTED FROM FATTENING PIGS IN POLAND IN YEARS 2019-2024

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Background and Objectives

The Actinobacillus pleuropneumoniae ability to rapidly develop antimicrobial resistance (AMR) poses a significant challenge to effective treatment. The data on A. pleuropneumoniae serotype distribution and AMR hinder evidence-based treatment strategies. This study examined the serotype diversity and AMR patterns of A. pleuropneumoniae isolates from porcine pleuropneumonia outbreaks in Poland between 2019 and 2024.

Material and Methods

119 clinical isolates of A. pleuropneumoniae were obtained from 67 farms with pleuropneumonia outbreaks located in northeastern Poland over years (2019–2024). Serotyping was conducted using a rapid slide agglutination test with specific antisera, as described by Nielsen (1986). Antimicrobial susceptibility was determined using the disk diffusion method in accordance with the Clinical and Laboratory Standards Institute (CLSI) guidelines. 22 antimicrobials were tested.

Results

Analysis of 119 isolates demonstrated the predominance of serotype 2 (65.5%). High resistance were observed for tylosin (55.5%), gentamicin (36.1%), doxycycline (32.8%), and sulfamethoxazole/trimethoprim (26.1%). Florfenicol and colistin maintained 100% efficacy against all isolates. The multidrug resistance pattern involved resistance to macrolides (n = 56) and tetracyclines (n = 37), in combination with aminoglycosides (n = 43) and/or sulfonamides (n = 30). Temporal analysis revealed diverse resistance patterns, with significant increases in sulfamethoxazole/trimethoprim ($p = 0.001$) and stability in tetracycline ($p = 0.890$). From 2022 onwards, strains exhibiting resistance to seven or more antimicrobials, including cephalosporins.

Discussion and Conclusion

The serotype distribution pattern demonstrates notable concordance with contemporary epidemiological trends observed throughout Europe, where serotype 2 maintains predominance. The findings highlight the dynamic nature of AMR development in A. pleuropneumoniae and underscore the need for ongoing surveillance in the region. The emergence of highly resistant strains, particularly those resistant to cephalosporins, raises concerns about future treatment options. The study emphasizes the importance of local AMR data in guiding antimicrobial use policies and the need for a coordinated approach to combat AMR in veterinary medicine.

BBD-PP-32

LEPTOSPIRA DIAGNOSTICS IN A SOW HERD IN NORTHWESTERN GERMANY

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Background and Objectives

Detecting fertility disorders involving Leptospira (L.) in pig herds can be challenging due to its often subclinial character and because no sample material is available for direct pathogen detection. Pigs serve as reservoir hosts for certain leptospiral serogroups (Australis, Pomona, Tarassovi), while they can get infected with several others (e.g.Canicola, Grippotyphosa, Icterohaemorrhagiae). The present case highlights infection and detection of most-likely non-host-adapted Leptospira in a sow-farm from an epidemiological perspective.

Material and Methods

A 200-sow-farm in Northwestern Germany reported reproductive disorders in Q1/24 (especially mummies). Vet described massive rodent population on-farm. As part of veterinary HERD HEALTH MANAGEMENT AND ECONOMY, 19 blood samples from non-pregnant sows were investigated for antibodies against 11 common swine serovars using MAT. Furthermore, aborted fetuses and four rats, which arose during standard rodent control program, were investigated using Leptospira-PCR. All investigations were done at IVD GmbH. MAT titers ε100 were considered positive. Antibiotic treatment and vaccination of sows against Leptospira (Porcilis® Ery+Parvo+Lepto) was implemented, performance data was obtained.

Results

In total 84,2% (16/19) serum samples yielded positive results for antibodies against Leptospira. Overall median was highest for serovars Copenhageni (600), Icterohaemorrhagiae (400) and Bratislava (400) while 3 sows showed titers ε3200 and 3 sows ε1600 for one or more of these serovars. PCRs from aborted fetuses and rats revealed positive results for Leptospira subclade P1. After treatment and vaccination performance stabilized (0.45 mummies/litter in Q1/24; 0.16 mummies/litter in Q3/24).

Discussion and Conclusion

Leptospira diagnostics can be a puzzle. Besides serological investigation and direct findings in aborted fetuses, in this case investigation of rats helped to understand Leptospira epidemiology and infectious pressure. Especially Leptospira serogroup Icterohaemorrhagiae, including serovars Icterohaemorrhagiae and Copenhageni, is related to rats. Rats are usually asymptomatic chronic shedders and contaminate the environment through urine. Rodent control is an essential biosecurity measure in swine production.

BBD-PP-33

COMPARISON OF COMPETITIVE AND INDIRECT ELISAS FOR DETECTION OF LAWSONIA INTRACELLULARIS ANTIBODIES IN SWINE

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Background and Objectives

Lawsonia intracellularis is the etiological agent of porcine proliferative enteropathy (PPE), a globally distributed disease that exerts a significant negative impact on production parameters. Owing to the intermittent fecal shedding of infected pigs and the substantial proportion of subclinical infected animals, antibody-based ELISAs are commonly used to evaluate the PPE health status of herds. The objective of this study was to compare the results of two different commercial ELISA (competitive vs indirect) against L. intracellularis.

Material and Methods

A total of 180 serum samples from 14 to 18-week-old L. intracellularis unvaccinated pigs from three farms were tested by the following ELISA:
ELISA A: Svanovir L. intracellularis / Ileitis –Ab; A competition ELISA test for the detection of L. intracellularis total antibodies.
ELISA B: AsurDX™ Lawsonia intracellularis Antibody Test. An indirect ELISA test for the detection of L. intracellularis IgG.
Results were compared statistically using the McNemar test and Cohen's kappa.

Results

ELISA A detected a total of 131 (72.78%) positive samples, whereas kit B detected only 52 (28.89%) positive pigs. These results revealed a significant discordance between the two assays ($p < 0.0001$), with a Kappa index of 0.077 and an observed agreement of 45%, corresponding to a very poor level of concordance.

Discussion and Conclusion

A low level of agreement was observed between the two ELISA. However, since the serological status of the animals was unknown and no reference standard was available, no conclusions can be drawn regarding the diagnostic sensitivity or specificity of either test. The differences in assay format (competitive versus indirect) and in the antibody classes detected may contribute to the observed discrepancies. These findings highlight the need for further studies to properly evaluate and compare the performance of the assays. In field conditions, it is advisable to clearly specify the ELISA test used and to interpret results accordingly in PPE control programs.

BBD-PP-34

CHARACTERIZATION OF GLAESSERELLA PARASUIS ISOLATED FROM SKIN LESIONS IN WEANED PIGLETS

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Background and Objectives

We describe an atypical clinical presentation of Glaesserella parasuis infection in weaned piglets, characterized by myositis and panniculitis. Isolates from skin lesions were analyzed using WGS to investigate potential determinants associated with this unusual tissue distribution.

Material and Methods

Necropsies and bacteriological investigations were performed in dead piglets, including sampling of meninges, heart blood, pericardium, peritoneum, pleura and subcutaneous tissue. Two isolates recovered from different piglets' skin lesions were subjected to WGS. MLST, serotyping and virulence gene profiling were performed and results were compared with a broad Gps genomic panel.

Results

Necropsies revealed polyserositis and only Gps was isolated in all samples. Moreover, after removing the skin, we observed a moderate amount of clear, fluid to gelatinous material in the subcutaneous tissue and hypodermis. Histopathology showed acute panniculitis, multifocal dermatitis and myositis. Both isolates clustered together within the Gps phylogeny and showed a virulence gene repertoire consistent with moderate-virulent Gps strains. Core virulence-associated genes were present, while the isolates carried only 4–6 vtaA paralogs, notably lacking vtaA5. This vtaA profile matched the cluster of low-to-intermediate virulence strains visible in the comparative heatmap.Conversely, both isolates possessed a complete iron-acquisition system, including TbpA and TbpB, with pairwise identities >98–100% to clinical Spanish isolates. According to recent phylogenetic studies, TbpB variants contribute to mucosal adaptation and iron scavenging rather than high systemic virulence. The full TonB complex (tonB, exbB, exbD) was also detected.A large set of genes involved in Fe–S cluster biosynthesis (iscR/S/U/A, hscA/B, fdx) and stress-response pathways (luxS, typA, groA, cydB) was identified, supporting bacterial adaptation to oxidative and hypoxic conditions that may prevail in inflamed subcutaneous tissues.

Discussion and Conclusion

Despite complete iron-uptake and stress-adaptation systems, no specific virulence marker could explain the atypical panniculitis/myositis. The findings indicate that host factors or local tissue conditions, rather than bacterial virulence, likely drove this unusual presentation.

BBD-PP-35

PREVALENCE AND SEVERITY OF ENZOOTIC PNEUMONIA AND PLEUROPNEUMONIA IN MEXICO

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Background and Objectives

Respiratory diseases such as enzootic pneumonia and pleuropneumonia continue to be present in swine herds. Monitoring these diseases is necessary to identify and correct control programs. One of the tools used is examination in slaughterhouses through macroscopic identification of lung lesions. This study aimed to determine the prevalence and severity of respiratory lesions in slaughterhouses in Mexico.

Material and Methods

From January to October 2025, 2,830 lung audits were conducted in 11 slaughterhouses for bronchopneumonia lesions, covering 180 farms distributed throughout the country and totaling 168,000 lungs evaluated. And for pleuropneumonia lesions, 2,229 audits were carried out on 176 farms, totaling 136,000 lungs assessed.The Ceva Lung Program (CLP - Ceva Animal Health, France), a system for scoring lung lesions, was used.The Mhyo-like lesions and App-like lesions indicators were considered as parameters of prevalence and severity of lung injuries: bronchopneumonic lungs (%), affected surface area of bronchopneumonic lungs (%), and dorsocaudal pleuritis (%). The evaluation for each farm was calculated as the average.

Results

The average percentage of affected lungs in the examined population was 34.79%, and the affected surface area was 6.4%. Additionally, 33.6% of lungs presented scarring, and 27.57% presented cranioventral pleuritis. For bronchopneumonia lesions, 16.17% presented dorsocaudal pleuritis, with an APP index of 0.45.

Discussion and Conclusion

These results, compiled from data from various farms across the country, provide an overview of the prevalence of lung lesions. Knowing the incidence of these diseases allows us to determine their economic impact and evaluate vaccination programs, therapeutic treatments, and management practices on pig farms.

BBD-PP-36

PREVENTIVE VACCINATION FOR PWD DUE TO E. COLI F4 OPTIMIZES PRODUCTION WITH A REDUCTION OF MORTALITY AND ANTIMICROBIAL USE DURING THE POST-WEANING PERIOD

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Background and Objectives

During the post-weaning period piglets might undergo infectious challenges such as enterotoxigenic Escherichia coli (ETEC) resulting in post-weaning diarrhea (PWD) and increased variation of piglets at the end of the nursery period. To prevent the negative effects of PWD due to E. coli, a preventive vaccination with live avirulent oral E. coli F4F18 vaccine (Coliprotec F4F18; Elanco AH) was implemented. The objective was to evaluate the effect of E. coli vaccination on PWD-related production data, mortality and antimicrobial use compared to a prior period using ZnO under UK conditions.

Material and Methods

Data from 10 different nursery barns were collected during 2 periods (Q1 2024 – ZnO 2,500 ppm; Q1 2025 – Coliprotec F4F18; Elanco AH) at 4 weeks of age. Data capture included number of piglets in the nursery, weight at entry and exit of the nursery period, average daily weight gain (ADWG), mortality, and antimicrobial use (mg/kg). Statistical analysis was performed using JMP 17.1.

Results

Weight at the end of nursery significantly improved following E. coli vaccination (39.42 ± 1.56 kg vs. 45.69 ± 1.49 kg; P = 0.000006). The ADWG significantly increased with + 52 g/d from 566.9 to 608.4 g/d (P = 0.0012). Following E. coli vaccination, there was a trend for improvement in percentage of mortality (3.7% vs. 2.3%; P = 0.057). The antimicrobial use (expressed in mg/kg) significantly decreased (142.6 ± 23.8 vs± 34.5 ± 18.4; P = 0.0076).

Discussion and Conclusion

In conclusion, implementation of a preventive vaccination of a live avirulent oral E. coli F4F18 vaccine (Coliprotec F4F18) could improve weight at the end of nursery and ADWG with a trend to reduce mortality during the post-weaning phase. Moreover, there was a significant reduction in antimicrobial use following E. coli vaccination.

BBD-PP-37

EVOLUTION OF THE ASSESSMENT OF LUNG LESION SCORE IN THE SLAUGHTERHOUSE IN SPAIN FROM 2021 TO 2025

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Background and Objectives

The post-mortem evaluation carried out in the slaughterhouse allows veterinarians to assess the swine respiratory complex implementing measurement of lesions associated with enzootic pneumonia and pleuritis, correlating this with productive parameters. The objective of this study was to compare the outcome of several assessments during 2025 with previous years, as a second part of the results presented at ESPHM 2023

Material and Methods

The researches established a system for evaluating 90 lungs from each batch of pigs slaughtered in Grupo Jorge company. An average of 250 batches have been evaluated weekly since 2021 representing around 1.000.000 lungs/year. Of the different methods for assessing enzootic pneumonia, the Mesons 0-5 system was used (0 = absence and 5 = maximum % of lesion), obtaining a disease index for each batch where a batch outcome greater than 1.0 is suspicious for disease. Pleuritis was determined as the absence or presence of lesion in each lung, obtaining the % of affected lungs in each batch.

Results

The average annual disease index increased from 0,54 in 2021 to 0,75 in 2025 (p-value<0,001); this increase has been gradual each year (0,62 and 0,67 in 2023/2024). The index peak is between weeks 30 and 35 in the last three years, and the lowest is around week 25. Regarding pleuritis, the results have been grouped by the percentage of injured lungs in each batch; severe cases of pleurisy increased fourfold between 2021 and 2024, with a 51% decrease in 2025 compared to 2024.

Discussion and Conclusion

The average enzootic pneumonia index during the last 3 years increased, showing statistically significance, highlighting the seasonality of injuries compared to the years 2021 and 2022. The introduction of high virulent variant of PRRSV (i.e. Rosalia) may be hindering the establishment of immunity in infected pigs against respiratory diseases.

BBD-PP-38

GASTRIC LESIONS AND HELICOBACTER SPP. COLONIZATION IN FATTENING PIGS: A TWO-YEAR SURVEY FROM SLOVAK ABATTOIRS

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Background and Objectives

Gastric ulcers represent a major health, welfare, and production concern in fattening pigs. Infection with Helicobacter spp., particularly Helicobacter suis, has been suggested as a contributing factor. This study aimed to determine the prevalence and severity of gastric lesions, evaluate the localization of Helicobacter spp. colonization in different stomach regions, and assess seasonal patterns in Slovak abattoirs over a two-year period**.**

Material and Methods

Between 2024 and 2025, 2,059 stomachs from slaughtered fattening pigs were collected and examined. The pars oesophagea was assessed macroscopically and classified as healthy, pre-ulcerative, or ulcerated. Samples from pars oesophagea, fundic, and pyloric regions were analyzed for Helicobacter spp. using rapid urease tests and impression smear cytology. Seasonal distribution of lesions and bacterial positivity was recorded.

Results

Macroscopic evaluation revealed healthy pars oesophagea in 54% of pigs, pre-ulcerative changes in 41%, and gastric ulcers in 5%. Helicobacter spp. colonization was most frequent in glandular regions: fundic area (66%) and pyloric area (23%), while the pars oesophagea showed lower prevalence (11%). Rapid urease testing was effective in high bacterial loads, whereas cytology enabled direct visualization of spiral-shaped bacteria. Slightly higher prevalence of gastric lesions was observed during winter months.

Discussion and Conclusion

The study confirms a substantial occurrence of gastric lesions and high prevalence of Helicobacter spp., especially in glandular stomach regions. Combining urease testing with cytology provides a reliable diagnostic approach. Seasonal trends suggest potential environmental or management influences. These findings underscore the need for continuous monitoring and targeted preventive strategies to improve swine health and welfare.

BBD-PP-39

CO-DESIGNING EVIDENCE-BASED INTERVENTIONS FOR SALMONELLA CONTROL WITH IRISH STAKEHOLDERS

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Background and Objectives

Salmonella remains one of the most important foodborne zoonoses in the EU, with pigs representing the primary source of human infection in Ireland. Despite the existence of a national monitoring and control programme, progress in reducing infection levels has been limited.

Material and Methods

In the Isle of Ireland, twenty-eight farrow-to-finish pig farms were selected. Samples of faeces, dust, water, and feed were taken for Salmonella isolation, alongside testing for Lawsonia intracellularis and Brachyspira spp. Each farm underwent a BiocheckUGent® biosecurity assessment, a Salmonella risk evaluation, and abattoir serology data review.

Results

Twenty-seven farms have completed sampling, with the proportion of Salmonella-positive samples per farm ranging from 4% to 57%. The nursery stage showed the highest positivity, averaging 35% positive samples. Thirtheen diferent serotypes were found with S. Rissen (24.3%) and monophasic S. Typhimurium (20.3%) being the most prevalent. Dust samples were positive for Salmonella on 11 farms. All farms tested positive for Lawsonia, while B. hyodysenteriae and B. pilosicoli were each detected on eight farms.

Discussion and Conclusion

Half of the participating farms will implement control plans developed through a co-design with stakeholders. Planned measures include enhanced cleaning and disinfection protocols, organic acid supplementation, improving biosecurity, Salmonella vaccination, and disease management based on identified vulnerabilities. Both groups will undergo regular sampling throughout the project to monitor Salmonella prevalence to assess intervention effectiveness. Concurrent smaller studies will be conducted to evaluate the effectiveness of the cleaning and disinfection protocol by assessing different pathogen loads at defined set points within the pens—before cleaning, after washing, and after disinfection.
Our project's approach of co-designing interventions with farmers' communities of practice is proving to be the most beneficial for identifying the best solutions for each farm.
This approach aims to generate evidence-based, stakeholder-supported strategies to reduce a persistent public health risk while improving overall pig health and sustainability.

BBD-PP-40

SCALING UP AND IMPROVING AN IN-HOUSE ELISA PROTOCOL TO EVALUATE SEROCONVERSION AGAINST VEPURED®-VACCINATED PIGLETS

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Background and Objectives

The edema disease (ED), which is caused by verotoxin 2e producing E. coli strains, typically affects piglets one to two weeks after weaning. Presentation ranges from per acute to subclinical, the latter affecting animals clinically healthy but underperforming. Vepured® (HIPRA) is a vaccine intended to protect piglets against ED. Despite the endemic nature of ED and routine vaccination, there is currently no serological method available to monitor post-vaccination seroconversion. This study is aimed at scaling up the production of an in-house indirect ELISA assay and improving its analytical performance to assess seroconversion in piglets following vaccination with Vepured®.

Material and Methods

First, two different methods were compared to assess result variation between them. Method A consisted of an in-house ELISA protocol performed at a bench scale, while method B consisted of a variation of the former incorporating the modifications required for industrial scale production in a ready to use (RTU) format. Next, the performance of the RTU method was evaluated with two different secondary antibodies: the original, a commercial IgG-class anti-IgG and a proprietary IgA-class anti-IgG antibody. To determine the cut-off, sensitivity and specificity of the method B, 440 sera with known status (serum neutralization) from naïve piglets, and from piglets at 21 and 28 days post-vaccination were tested.

Results

The results of this study show that the industrial and the in-house methods have very similar sensitivity (72.8 % and 74.4 % respectively) and specificity (95.8.% and 95.9%, respectively). Interestingly, replacing the secondary antibody from the commercial IgG to the in-house IgA in the industrial version resulted in increased sensitivity and specificity (95.1 % and 97.8% respectively).

Discussion and Conclusion

These results point that the improved RTU ELISA method can effectively detect seroconversion in piglets 21 and 28 days after vaccination with Vepured®.

BBD-PP-41

CARVACROL AS A POTENTIAL STRATEGY TO REDUCE TETA EXPRESSION AND OVERCOME TETRACYCLINE RESISTANCE IN PORCINE SALMONELLA TYPHIMURIUM

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Background and Objectives

Salmonella Typhimurium is a pathogen of relevance to animal and public health that causes one of the most common foodborne diseases in humans, with pigs as a key reservoir. Antimicrobial resistance is driving the search for alternatives. The aim of this study was to evaluate the antimicrobial effect of carvacrol and tetracycline, individually and in combination, against strains of porcine origin, as well as the influence of carvacrol on the expression of genes associated with resistance to this antibiotic.

Material and Methods

The minimum inhibitory concentration (MIC) and bactericidal concentration (MBC) of carvacrol against 73 strains of S. Typhimurium were determined by broth microdilution (CLSI, 2024). Antimicrobial interaction of tetracycline with carvacrol was evaluated against 14 tetracycline-resistant strains using the synergy method in a chessboard microdilution, calculating the Inhibitory Concentration Fraction Index. For the genetic study, RNA was extracted at mid-exponential phase after incubating the cells with carvacrol and/or tetracycline at concentrations that attenuated bacterial growth, using cultures grown in Todd–Hewitt broth as the control condition. These were subjected to quantitative real-time PCR analysis and the relative expression of the tetracycline resistance gene tetA was calculated.

Results

Most strains were sensitive to carvacrol concentrations of 4 to 1 mg/mL. The MBC coincided with the MIC for 84,9% of the strains. Synergistic activity with tetracycline was observed in 2 strains and additivity in 7, reducing the concentration of antibiotic required to inhibit growth by up to 8 times. In the genetic study, two of the three strains analysed showed lower expression of the tetA gene in the combined treatment compared to individual treatment with the antibiotic.

Discussion and Conclusion

In conclusion, carvacrol exhibited antimicrobial activity against S. Typhimurium resistant to tetracycline. In combination with tetracycline, it enhanced efficacy by modulating resistance and reducing tetA gene expression.

BBD-PP-42

PIG MICROBIOME HEALTH EFFECTS OF A LACTOBACILLUS-DERIVED POSTBIOTIC

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Background and Objectives

Bacterial intestinal infections are a serious threat to pig health and cause significant economic losses in production. The objective of this study was to explore a Lactobacillus-based postbiotic feed additive for its potential to suppress pig pathogens and support a well-balanced gut microbiota. Antagonism was assessed by co-cultivation with pathogens affecting diverse production stages. Microbiome modulation was investigated in ex vivo microbiota fermentations using natural pig hindgut slurries.

Material and Methods

Lactobacillus LB is a heat-treated preparation of cellular biomass and a fermentate generated by Limosilactobacillus fermentum CNCM MA65/4E-1b and Lactobacillus delbrueckii subsp. delbrueckii CNCM MA65/4E-2z. Growth suppression of pathogens including various serovars of enterotoxigenic Escherichia coli (ETEC), Salmonella enterica, Clostridium perfringens, Streptococcus suis and Brachyspira pilosicoli was assessed using optical density, metabolic activity and/or flowcytometry measurements in microdilution broth assay. Microbiota effects of diverse postbiotic formulations and concentrations were examined in a controlled colon fermentation batch model using Illumina shotgun metagenomics and short chain fatty acid (SCFA) profiling obtained by ion chromatography and mass spectrometry.

Results

The postbiotic significantly inhibited pathogens including ETEC and S. enterica serovars (33.7% ± 18.7, n=18, $p<0.001$), B. pilosicoli (69.3% ± 12.6, n=9, $p<0.001$), S. suis (91.0% ± 1.7, n=7, $p<0.001$), and C. perfringens (97.6% ± 4.8, n=12, $p<0.001$). Fermentation results revealed a reduction of Clostridium sp., Campylobacter sp. and Clostridioides difficile. Beta diversity analysis showed clear shifts in taxon composition in the treatment group compared to the control ($p=0.001$). The unformulated postbiotic increased Bifidobacterium and Limosilactobacillus. SCFAs were elevated, with lactic acid reaching 56.64 ± 18.74 mmol/L ($p<0.001$) and acetic acid 39.21 ± 24.75 mmol/L ($p=0.04$) after 19h.

Discussion and Conclusion

The results showed that postbiotics might be able to promote pig health by supporting a balanced gut microbiota during critical production stages. These findings should be examined with the final formulation in vivo.

BBD-PP-44

MOLECULAR DETECTION OF HELICOBACTER SUIS IN PORCINE GASTRIC TISSUE USING RNASCOPE-BASED IN SITU HYBRIDIZATION

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Background and Objectives

Helicobacter (H.) suis is highly prevalent in pigs, with infection rates around 80% at slaughter age. This study aimed to compare conventional PCR and RNAscope in situ hybridization (ISH) to detect and localize H. suis in gastric tissue from pigs at slaughter age and to evaluate the correlation between both diagnostic methods.

Material and Methods

Gastric tissue samples (fundic, pyloric, and esophageal regions) and gastric lymph nodes (GLN) from 20 22-week-old, healthy pigs with no gastric ulcers were analyzed by H. suis conventional PCR and RNAscope ISH. Tested animals were selected according to agarose-gel band intensity by PCR in at least one stomach region (PCR negative, PCR-positive +, PCR-positive ++ and PCR-positive +++; 5 in each category). H. suis ISH was scored also by means of negative, mild, moderate and high amount of bacterial RNA signal.

Results

H.suis DNA was detected by PCR in 5/20 fundus, 11/20 pylorus, 11/20 esophageal samples, and 3/20 GLN. RNAscope signal was present in 10/20 fundus, 13/20 pylorus, and 7/20 esophageal pars samples, but not in any GLN. Globally, H. suis was detected in at least one sample in 15/20 by PCR and 16/20 by ISH techniques. Therefore, 15 pigs were positive by both techniques, one pig only by RNAscope, and four pigs were negative by both. By sample type, 18/20 pylorus, 17/20 GLN, 14/20 fundus and 14/20 esophageal pars got concordant results (both methods positive or negative).

Discussion and Conclusion

RNAscope showed greater sensitivity in fundic and pyloric tissues and allowed localization of bacteria within the mucosa, while PCR detected additional positives in esophageal samples and in the GLN. Despite these differences, concordance between methods was high. The absence of significant gastric lesions supports that natural H. suis infection at slaughter age is mostly subclinical.

BBD-PP-45

SEASONALITY AND INCIDENCE OF SLAUGHTERHOUSE-ASSESSED LUNG LESIONS IN SPAIN

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Background and Objectives

Respiratory diseases in pigs are multifactorial. Slaughterhouse lung lesion scoring provides insights into the incidence and severity of Enzootic pneumonia (Ep)-like lesions, as well as dorso-caudal pleurisy, typically associated with Actinobacillus pleuropneumoniae (App). This study aimed to evaluate the influence of seasonality on lung lesions detected at slaughter.

Material and Methods

A total of 8,187 batches and 1,309,726 lungs were assessed in slaughterhouses across Spain between January 2016 and October 2025. Four seasonal groups were defined based on slaughtering period: January-March (n=2189), April-June (n=1709), July-September (n=1742), October-December (n=2547). Lungs were scored using Ceva Lung Program methodology. The following parameters were calculated at batch level: Ep-like lesions, Broncho-pneumonic lungs (BPL), Average affected surface (AAS), Ap-like lesions, Dorso-caudal pleurisy (DCP), and Severity index (APPI). Statistical comparisons were performed using the Kruskal-Wallis test with pairwise comparisons; significance was set at $p<0.05$.

Results

Results were as follows: Group 1 (BPL 36.35% (IC95%=35.36-37.35%); AAS 2.41% (IC95%=2.30-2.53%); DCP 19.88% (IC95%=19.18-20.58%); APPI 0.54 (IC95%=0.52-0.56)). Group 2 (BPL 33.40%, IC95%=32.34-34.46%; AAS 2.17%, IC95%=2.04-2.29%); DCP 15.82% (IC95%=15.15-16.48%); APPI 0.44 (IC95%=0.42-0.46)). Group 3 (BPL 34.4% (IC95%=32.97-35.11%); AAS 2.57% (IC95%=2.43-2.72%); DCP 15.82% (IC95%=15.17-16.46%); APPI 0.45 (IC95%=0.43-0.46)). Group 4 (BPL 37.83% (IC95%=36.90-38.75%); AAS 2.61% (IC95%=2.50-2.72%); DCP 17.28% (IC95%= 16.67-17.90%); APPI 0.46 (IC95%=0.44-0.47)). Statistically significant differences in BPL were found between group 1 and 2 ($p<0.001$), group 1 and 3 ($p<0.05$) and group 4 versus groups 2 and 3 ($p<0.001$). For AAS, significant differences were observed between group 4 and groups 1($p<0.05$) and 3 ($p<0.001$). Regarding App-like lesions, both prevalence and severity were significantly higher ($p<0.001$) in group 1 compared to groups 2, 3 and 4.

Discussion and Conclusion

EP-like lesions were more prevalent in colder months; severity peaked mid-year. App-like lesions were highest early in the year. However, seasonal differences were minimal and clinically irrelevant.

BBD-PP-46

VALIDATION OF A NEW GENERATION ELISA TEST FOR ANTIBODY DETECTION OF ANTIBODIES AGAINST MYCOPLASMA HYOPNEUMONIAE

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Background and Objectives

Mycoplasma hyopneumoniae, the causative agent of enzootic pneumonia, causes major economic losses in swine production by reducing growth performance, feed efficiency, and resilience to secondary respiratory infections. Accurate serological monitoring is essential for effective control, yet variability among commercial assays often limits diagnostic confidence. To address this need, IDvet developed the ID Screen® Mycoplasma hyopneumoniae competitive ELISA, which uses a monoclonal antibody targeting a conserved P65 epitope to improve specificity and sensitivity across diverse field conditions.

Material and Methods

Analytical specificity was evaluated with sera from pigs inoculated with Mycoplasma flocculare, M. hyorhinis, or M. hyosynoviae, collected at 0 and 56 days post-inoculation (dpi) at Iowa State University (ISU). Diagnostic sensitivity was determined using sequential sera from eight pigs experimentally infected with M. hyopneumoniae between 0 and 56 dpi. A comparison with the IDEXX indirect ELISA was performed at the ISU Veterinary Diagnostic Laboratory (VDL). An independent evaluation at the University of Minnesota VDL included 152 field samples collected over a 10-month period and previously classified as false positives by the comparative ELISA from herds negative for M. hyopneumoniae. Additional sera came from a site with vaccinated and acutely infected animals.

Results

All sera from negative herds and pigs inoculated with other Mycoplasma species tested negative using the competitive test, confirming high analytical and diagnostic specificity. The assay detected earlier seroconversion (17–49 dpi) compared with the IDEXX indirect ELISA (24–49 dpi). In the UMN VDL dataset, several samples initially flagged positive by the comparative assay tested negative with the competitive test, supporting improved specificity. Overall, the competitive test showed 68% sensitivity and 95.39% specificity.

Discussion and Conclusion

Together with findings presented by Dr. Devi Patnayak at AAVLD 2024, these results support the ID Screen®Mycoplasma hyopneumoniae competitive ELISA as a robust tool for serological surveillance in swine production systems.

BBD-PP-47

EVALUATION OF THE ROLE OF MATERNAL AND SELF-GENERATED ANTIBODIES AGAINST DIFFERENT ANTIGENS OF STREPTOCOCCUS SUIS IN BACTERICIDAL IMMUNITY IN PIGLETS IN A FIELD STUDY

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Background and Objectives

Streptococcus suis (S. suis) causes severe pathologies. Invasive strains express surface proteins, including muramidase-released protein (Mrp), surface antigen one (Sao), and the IgM-degrading enzyme Ide_{Ssuis}. Many virulent strains secrete the pore-forming toxin suilysin. Although studied in vaccination trials, the role of maternal antibodies against these factors in the field remains unclear. We measured specific antibody levels in colostrum and piglets' sera, as well as S. suis survival in piglets' blood, to elucidate the role of maternal antibodies in a herd vaccinated pre-farrowing with an autogenous S. suis bacterin.

Material and Methods

Colostrum samples of gilts, middle-aged sows and old sows (each n=8) were collected. Colostrum intake was quantified in three piglets per litter. Antigen-specific IgG in colostrum and piglets' sera and IgM binding to the streptococcal surface was determined by ELISA. Survival of S. suis wt and isogenic mutants were investigated in blood drawn from piglets at 2, 6 and 10 weeks of age. Linear mixed-effect models (LMMs) were run to analyse correlations with streptococcal survival.

Results

Specific IgG levels in 2-week-old piglets significantly correlated with colostrum levels and declined thereafter, confirming maternal origin. In contrast to IgG, levels of ⟨S. suis IgM in sera of 2-week-old piglets did not correlate with colostral specific IgM but with colostrum intake. Survival factor of wt and ide_{Ssuis} mutants demonstrated that expression of functional or non-functional full-length Ide_{Ssuis} results in increased killing of serotype 2 in blood of 2-week-old-piglets. This phenotype vanished until week 10. LMMs demonstrated a significant, time-independent effect of ⟨Ide_{Ssuis} IgG on S. suis wt, whereas ⟨S.suis IgM influenced survival in a time-dependent manner.

Discussion and Conclusion

Piglets possess maternal ⟨Ide_{Ssuis}, ⟨Mrp, ⟨Sao, and ⟨suilysin IgG at two weeks of age. Maternal ⟨Ide_{Ssuis} IgG contributes to bactericidal immunity in the field, most likely via Fc-mediated opsonophagocytosis.

BBD-PP-48

ASSESSMENT OF THE EFFECTIVENESS OF TWO STREPTOCOCCUS SUIS BACTERIN-AUTOGENOUS VACCINES ON A DUTCH FARM

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Background and Objectives

Streptococcus suis (S. suis) is a major cause of meningitis and systemic disease in pigs. In the Netherlands, serotypes 2, 7 and 9 are most frequently associated with clinical disease in piglets. Although no commercial vaccine is available and autogenous vaccines are widely used for preventive purposes, there is a marked lack of robust studies assessing their efficacy. This field study aims to compare the efficacy of two different autogenous S. suis vaccines.

Material and Methods

The field observation was conducted on a Dutch farm with 625 sows operating in a weekly batch system. Initially, the sows and gilts were immunized with an autogenous vaccine containing 6 S. suis serotypes; 1, 2, 7, 8, 9 and 19 (product A). Due to continued high antibiotic usage and elevated mortality, a second autogenous vaccine (product B) was introduced. Product B consisted of a S. suis autogenous vaccine, containing 3 serotypes; 2, 7 and 9. The S. suis serotype 9 strain was specifically processed to augment the immunogenicity against this serotype. The performance of products A and B was compared by monitoring antibiotic usage and mortality rates.

Results

In total 35,856 piglets were monitored. The first group (G1), consisting of 17,646 piglets, originated from sows vaccinated with product A. The second group (G2), totaling 18,210 piglets, was born from sows vaccinated with product B. The mortality rate decreased (G1 = 2.3%; G2 = 1.2%) and a similar decline was observed in antibiotic usage. Correspondingly, the DDD (Defined Daily Dose Animal per farm per year) was reduced (G1 = 18; G2 = 9.5).

Discussion and Conclusion

Autogenous vaccines offer a practical strategy to control S. suis on farms. Careful monitoring and tailored adjustments can markedly reduce mortality and antibiotic usage.

BBD-PP-49

PREVENTIVE VACCINATION FOR PWD DUE TO E. COLI F4 REDUCES ANTIMICROBIAL USE AND PERCENTAGE OF RUNT PIGLETS AT THE END OF NURSERY

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Background and Objectives

During the post-weaning period piglets might undergo infectious challenges such as enterotoxigenic Escherichia coli (ETEC) resulting in post-weaning diarrhea (PWD) and increased piglet variation. To prevent the negative effects of PWD, a preventive vaccination with live avirulent oral E. coli F4F18 vaccine (Coliprotec F4F18; Elanco AH) was implemented. The objective was to evaluate the effect of E. coli vaccination on PWD-related disease, mortality, number of runt piglets and TI_{100} at the end of the nursery period.

Material and Methods

An 800-sow farm (TN70) suffered from PWD during the post-weaning period. Following confirmation of the E. coli pathotype (F4-ETEC), a vaccination with a live avirulent oral E. coli F4F18 vaccine (Coliprotec F4F18; Elanco AH) was implemented at 18 days of age. Data capture included number of piglets (d0-40), mortality, number of runt piglets and antimicrobial use (TI_{100}). The trial compared a historical control group (n = 3 batches, 1908 piglets) to a vaccine group (n = 3 batches, 2254 piglets). Statistical analysis was performed using JMP 17.1.

Results

Mortality following E. coli vaccination significantly reduced (7 vs. 19; P = 0.001; 3.1% vs. 0.9%; P = 0.003). Moreover, a significant improvement in the number (6 vs. 55; P = 0.001) and percentage (0.9% vs. 8.6%; P = 0.006) of runt piglets occurred. The number of days on antimicrobial treatment, given as TI_{100}, reduced from 12.5 days to 0 days following E. coli vaccination (P < 0.001). A positive ROI of + 2.06 (vaccine cost included) was generated. For the 800-sow farm, this resulted in an increase income of € 57,771.55.

Discussion and Conclusion

In conclusion, implementation of a preventive vaccination of a live avirulent oral E. coli F4F18 vaccine reduces mortality and number of runt piglets during the post-weaning period, while reducing the TI_{100}. Overall, a positive ROI of 2.06 per piglet was obtained.

BBD-PP-50

SEASONALITY OF MYCOPLASMA HYOPNEUMONIAE AND ACTINOBACILLUS PLEUROPNEUMONIAE LUNG LESIONS IN TAIWANESE SWINE FARMS: A 2021–2024 LONGITUDINAL SLAUGHTERHOUSE SURVEY

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Background and Objectives

Respiratory diseases, particularly those associated with Mycoplasma hyopneumoniae (Mhyo) and Actinobacillus pleuropneumoniae (APP), remain a primary cause of economic loss in Taiwan. While pathogen prevalence is documented, seasonal dynamics in this subtropical climate remain less defined. This study evaluated seasonal fluctuation of Enzootic Pneumonia (EP) and APP-indices in central and southern Taiwan from 2021 to 2024.

Material and Methods

Slaughterhouse lung scoring followed the Ceva Lung Program (CLP) methodology. Data (2021-2024) from 12 central and southern Taiwanese farms were analysed. To minimize variation, specific farm audits were performed by the same auditor. In total, 2,746 lungs were audited (minimum 14/farm/season). Seasons were defined as Winter (Dec–Feb), Spring (Mar–May), Summer (Jun–Aug), and Autumn (Sep–Nov). EP (Mhyo-like) and APP (APP-like) indices were calculated.

Results

The aggregated data revealed distinct seasonal patterns. The EP Index peaked in Winter (Mean=7.03), declining through Spring (5.67) and Summer (4.99) to an Autumn nadir (4.48). Notably, high-challenge farms showed Winter EP indices >10.0. Conversely, the APP Index (APPI) peaked in Spring (Mean=1.09) and Winter (1.02), with lower pressures in Summer (0.88) and Autumn (0.74). The APPI showed greater farm-to-farm variability than EP.

Discussion and Conclusion

This study confirms a strong seasonality for respiratory lesions in Taiwanese herds. Mhyo pressure is most severe during Winter, likely driven by ventilation challenges and temperature fluctuations. APP pressure persists longer, peaking in Spring. These findings suggest that optimal climatic control and vaccination would be key to prevention of respiratory disease.

BBD-PP-51

REDUCTION IN MESOMYCOPLASMA HYOPNEUMONIAE COLONISATION IN PIGLETS FOLLOWING MASS VACCINATION OF SOWS

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Background and Objectives

Mesomycoplasma hyopneumoniae (M. hyo) is the primary pathogen of enzootic pneumonia (EP). Despite the availability of vaccines, it remains a major contributor to the porcine respiratory disease complex (PRDC), which causes significant economic losses to the pig industry. Prepartum vaccination of sows has been shown to reduce piglet colonization; however, vaccination of gestating sows against M. hyo is not commonly practiced under field conditions. This field trial aimed to evaluate the impact of mass sow vaccination against M. hyo on reducing colonization in their offspring.

Material and Methods

The study was conducted in a commercial herd in northeastern Spain. EP was diagnosed in finishers based on clinical signs and PCR detection of M. hyo in deep tracheobronchial swabs, despite piglets being vaccinated at weaning (3 weeks of age). After detecting M. hyo in fattening pigs, sows received two mass vaccinations, 4 weeks apart. 60 pigs were sampled before sow vaccination (control group) and 120 pigs after vaccination. Deep tracheobronchial swabs were collected at 15, 20, and 25 weeks of age, and individual PCR tests were performed.

Results

Significant differences were observed between groups in terms of PCR positivity. Kaplan-Meier analysis showed that 42% of control pigs were PCR-positive at 15 weeks, 92% at 20 weeks, and 97% at 25 weeks. In contrast, pigs from vaccinated sows were 19% positive at 15 weeks, 44% at 20 weeks, and 70% at 25 weeks. Mean CT values were significantly higher in the vaccinated group at all sampling points, indicating lower bacterial load.

Discussion and Conclusion

Under these conditions, sow vaccination against M. hyo reduced PCR-positive prevalence and bacterial load up to 25 weeks of age. Mass sow vaccination could help control M. hyo in production systems, though further research is needed to assess its impact on finishing performance.

BBD-PP-52

RELATIONSHIP BETWEEN ANTIBODIES AGAINST ACTINOBACILLUS PLEUROPNEUMONIAE TOXINS IN SOWS AND THEIR PIGLETS AT 24 HOURS OF LIFE

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Background and Objectives

Swine pleuropneumonia, caused by Actinobacillus pleuropneumoniae (App), involves several virulence factors, notably the ApxI–IV toxins. This study aimed to assess, in an App-positive herd, the antibody levels and distribution against these toxins in 24-hour-old piglets, and their correlation with maternal antibody levels

Material and Methods

In an App-endemic commercial farm, 42 piglets from 7 different parity sows were randomly selected and ear tagged. Blood serum samples were taken from piglets at 24 hours of life and from their respective mothers.These samples were analysed through four enzyme-linked immunosorbent assay (ELISA) tests against Apx toxins I, II, III (in-house ELISA), and IV (IDEXX APP-ApxIV Ab, Idexx, USA), expressing the results in S/P value. Correlations were analysed using Spearman's correlation coefficient (r_s), and statistical difference was set at 0.05.

Results

In S/P ratio, in piglets at 24 hours of life were detected the following values for ApxI: 0.733 (IC95%= 0.505 – 0.960), ApxII: 2.907(IC95%=2.654 – 3.160), ApxIII: 1.098 (IC95%= 0.956 – 1.241), ApxIV: 1.677 (IC95%=1.555 – 1.800)In their mothers were detected the following values for ApxI: 0.541 (IC95%= 0.126 – 0.956), ApxII: 2.377 (IC95%=1.717 – 3.037), ApxIII: 0.913 (IC95%= 0.425 – 1.402), and ApxIV: 1.412 (IC95%=0.965 – 1.859). The first parity sow was seronegative for ApxI and ApxIV in these tests.A positive correlation was determined for all types of antibodies ($p<0.001$): ApxI ($r_s=0.696$), ApxII ($r_s=0.738$), ApxIII ($r_s=0.613$), and ApxIV ($r_s=0.496$).

Discussion and Conclusion

In all cases, differences in maternal antibody levels determined the concentration and uniformity of antibodies in 24-hour-old piglets, reflecting the sow's exposure to A. pleuropneumoniae and its toxins. The ApxI, -II, and -III anti-toxin antibodies may also originate from bacteria other than App. A seronegative sow was detected at her first farrowing, resulting in piglets with very low antibody titers against App and an increased risk of early clinical outbreaks.

BBD-PP-53

AN INDIRECT RECOMBINANT ANTIGEN ELISA TO DETECT LAWSONIA INTRACELLULARIS-SPECIFIC ANTIBODIES

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Background and Objectives

Lawsonia intracellularis(LI) causes the disease Proliferative enteropathy. In it's chronic form it is characterised by diarrhoea and reduced DWG, leading to substantial economic losses in pig production. Currently, the only serological assay being commercially available is based on whole-cell antigen preparations. However, an ELISA using recombinant proteins may induce a high-affinity LI antibody binding, thus possibly increasing the specificity. Our aim was to identify potential antigens of LI, produce them as recombinant proteins and evaluate their antigenic potential to be used in an indirect ELISA to selectively detect LI antibodies in porcine serum.

Material and Methods

Five recombinant proteins were selected based on literature and bioinformatics methods. Genes encoding the recombinant proteins were synthesized, inserted into a plasmid, expressed by E.coli and purified. An indirect ELISA was developed with recombinant proteins coated on separate wells. Eight samples from verified positive and eight samples from verified negative pigs were tested. For every recombinant protein, the Mann Whitney test was used to compare the values of the positive and negative sera.

Results

All five of the selected recombinant proteins were based on proteins annotated as LI bacterial surface proteins or secreted proteins. The five recombinant proteins were successfully produced and purified. With all five recombinant proteins, a significant difference was found between the positive samples and the negative samples (P= 0.0002).

Discussion and Conclusion

All five recombinant proteins show great potential to be used as diagnostic antigens. Future steps to validate the ELISA should be to test more serum samples from verified positive and negative pigs. Further the assay needs to be evaluated on naturally infected as well as vaccinated pigs and animals of different age groups and farms. We will proceed with these recombinant proteins, validating and optimizing the diagnostic ELISA.

BBD-PP-54

PRESENCE OF STREPTOCOCCUS PNEUMONIAE IN SWINE PRODUCTION: INITIAL EVIDENCE

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Background and Objectives

Streptococcus is a Gram-positive coccoid bacterium forming chains or pairs, part of the normal microbiota of skin and respiratory and gastrointestinal systems. Certain species, however, can be pathogenic, affecting humans and animals, emphasizing their control, particularly in swine. While Streptococcus suis is a major etiological agent of arthritis, septicemia, and systemic conditions, Streptococcus pneumoniae is clinically relevant due to its ability to induce pneumonia. This study aimed to preliminarily identify S. pneumoniae to assess its potential presence and incidence in commercial swine herds.

Material and Methods

A necropsy was performed on a pig with respiratory signs from a central region of a Chilean farm. Samples were collected from lung tissue, umbilical abscess swabs, and pericardial and peritoneal compartments. Samples were cultured in brain-heart infusion broth, Blood, Chocolate, and MacConkey agar, followed by antimicrobial susceptibility testing. Additionally, the samples were analyzed by histopathology

Results

Streptococcus pneumoniae was isolated from the specimens. Susceptibility testing indicated sensitivity to florfenicol 30 µg, sulfamethoxazole–trimethoprim 25 µg, amoxicillin 25 µg, oxytetracycline 30 µg, ceftiofur 30 µg, and enrofloxacin 5 µg; and resistance to tilmicosin 15 µg, and penicillin 10 U. Regarding histopathology, thickening of the alveolar septa due to infiltration of mononuclear cells was observed. The respiratory airways showed no exudate.

Discussion and Conclusion

Although S. suis is a recognized zoonotic pathogen reported in Latin America (Bakpatina-Batako, M. V. D. P. et al., 2025), S. pneumoniae can similarly cause severe clinical manifestations. Reports of S. pneumoniae in swine production are scarce, with literature mostly focused on experimental pneumococcal pneumonia models for human research (da Greeff et al., 2016; Amaro et al., 2021). Its neurological involvement in pigs and potential impact on swine health, pathophysiology, and production require further investigation to clarify its epidemiological and clinical relevance.

BBD-PP-55

DISINFECTION CAPACITY OF INTRA MULTI-DES GA ON SALMONELLA SPP. UNDER DIFFERENT CIRCUMSTANCES

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Background and Objectives

Cleaning and disinfection are critical components of on-farm biosecurity programs aimed at controlling infectious pathogens, including Salmonella. Environmental contamination serves as a reservoir for the bacteria, facilitating transmission between animals. Effective disinfection depends on applying the correct biocidal concentration, which can be influenced by factors such as pathogen species and strain, ambient temperature, contact time, and presence of organic material. This study evaluated the efficacy of selected disinfectant concentrations against multiple Salmonella strains under varying organic load conditions and contact times.

Material and Methods

Different concentrations of Intra Multi-Des GA (a biocidal agent based on glutaraldehyde, quaternary ammonium compounds and supporting elements) were tested under low soiling (3.0 g/L BSA) and high soiling (10 g/L BSA + 10 g/L yeast extract) conditions and short (5 minutes) and long (30 minutes) contact times. Studies were conducted according to EN14349 standards using Salmonella enterica serovar Infantis and Java.

Results

Both organic load and contact time influenced disinfection efficacy. The required > log 4 elimination was achieved with 0.2% concentration with long contact and at 0.5% concentration with short contact time. Increasing the organic load from low to high soiling required at least an duplication of the disinfectant concentration to achieve the same efficacy.

Discussion and Conclusion

This study shows the tested disinfectant is effective in the elimination of different Salmonella strains under different practical conditions. The results highlight the importance of thorough cleaning prior to disinfection. It is important to choose the disinfectant concentration based on the contact time and soiling conditions that can be achieved in practice.

BBD-PP-56

EFFECT OF PAROMOMYCIN AND ENROFLOXACIN ADMINISTRATION ON INTESTINAL MICROBIOTA DEVELOPMENT OF PIGS DURING THE FIRST 6 WEEKS POST-WEANING

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Background and Objectives

Prevotellaceae, Ruminococcaceae, Lachnospiraceae, Veillonellaceae and Acidaminococcaceae are part of the core gut microbiota of healthy piglets post-weaning. The effect of paromomycin (Parofor®) and enrofloxacin administration in post-weaning pigs on gut microbial composition and abundance was investigated.

Material and Methods

Fifteen healthy weaned crossbred pigs were individually assigned per random to control (unmedicated) and two treatment groups (5 pigs per group). One week after weaning paromomycin (25mg/kg bw) was administered via medicated water for 3 days (D0-D3) and enrofloxacin (5mg/kg bw) was administered parenterally for 3 days (D0-D3).
Rectum faecal samples were collected prior to antibiotic treatment (D0) and after initiation of treatment (D3, D7, D10, D14, D21, D28, D35, D42). Faecal samples were processed for DNA isolation and full-length 16S rRNA gene amplicon sequencing (Oxford Nanopore Technologies) to identify the bacterial composition and diversity.

Results

Higher abundances of Lachnospiraceae and Veillonellaceae were determined in paromomycin-treated pigs compared to enrofloxacin and control groups. Higher abundances of Prevotellaceae, Ruminococcaceae and Acidaminococcaceae over the whole trial period (D3-D42) were found in the paromomycin group in particular compared to control group.
On the other hand, abundances of Clostridiaceae and Peptostreptococcaceae were lower at nearly all time points (D0-D42) in the paromomycin group versus the enrofloxacin and control group.

Discussion and Conclusion

Abundances of the core bacterial families of paromomycin-treated pigs differed from enrofloxacin-treated and control pigs. Higher abundances of Lachnospiraceae and Veillonellaceae are in line with the shift of the microbial composition observed post-weaning and linked to a carbohydrate fermenting microbiota. The decrease in Clostridiaceae and Peptostreptococcaceae abundances further confirms this microbiota shift post-weaning. Considering the small sample size these results verify that the physiological microbiota transition and maturation post-weaning can be supported by the use of paromomycin (Parofor®). Paromomycin can contribute to gut microbiota homeostasis and stabilization of the intestinal microbial community.

BBD-PP-58

EVALUATION OF TURBINATE LESIONS ON IBERIAN PIG FARMS IN EXTREMADURA, SPAIN

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Background and Objectives

Atrophic rhinitis is characterized by inflammation and atrophy in nasal turbinates, causing facial deformities, breathing difficulties, reduced weight gain, and poorer feed conversion, causing economic losses. It is caused by Bordetella bronchiseptica (non-progressive) and Pasteurella multocida (progressive). Prevention of the disease via vaccination of sows reduces transmission and prevents new outbreaks. This study evaluated nasal turbinate integrity in Iberian pigs slaughtered in Extremadura (Spain) to determine the prevalence and severity of atrophic rhinitis within a single production system.

Material and Methods

A total of 10 farms (around 8,000 sows in total) and 268 pigs were included in this analysis. After slaughtering, snouts were sectioned transversely to evaluate the integrity of nasal turbinates. Each snout received a lesion score from 0 to 18, where: 0 means no lesion (normal); 1–4 mild atrophy; 5–8 moderate atrophy; 8–18 severe atrophy, following the European Pharmacopea scoring method.

Results

The results showed that the mean turbinate lesion score across all farms was 3.86/18, within the mild category. Seven farms were categorized into mild atrophy group, one farm in the moderate atrophy group, and two farms in the severe atrophy group. Two severe farms (score >8) were detected. Approximately 84% of turbinates showed some degree of lesion, confirming a mild level of nasal atrophy in the region.

Discussion and Conclusion

The findings are consistent with mild-moderate atrophic rhinitis pressure, with some variability between farms. This could result in economic losses so vaccination could be one of the measures implemented to reduce its impact.

BBD-PP-59

ANTIMICROBIAL SUSCEPTIBILITY OF STAPHYLOCOCCUS HYICUS STRAINS ISOLATED IN NORTHERN-ITALY BETWEEN 2022 AND 2025

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Background and Objectives

Sudden outbreaks of exudative epidermitis (EE) are typically managed with antibiotics. This study describes the antimicrobial susceptibility of Staphylococcus (S.) hyicus strains isolated in Northern-Italian pig farms between January 2022 and April 2025.

Material and Methods

The strains resulted from bacteriological examinations performed on skin swabs (65) and synovial fluid (1) of pigs with clinical and/or anatomopathological picture indicative of EE. Samples were plated on Blood Agar and Gassner agar and incubated in aerobiosis at 37° C for 24-48h. Presumptive colonies were identified by MALDI TOF MS. Antimicrobial susceptibility was assessed by determination of the MIC of 16 antimicrobials in broth microdilution using customized microtiter plates according to CLSI guidelines. MIC_{50} and MIC_{90} of each antimicrobial were evaluated and strains were classified as wild type (WT) or non-WT according to the ECOFFs proposed by EUCAST for S. hyicus and S. aureus.

Results

Every antimicrobial showed a multi-modal distribution of the MICs along the range tested with different sub-population of strains with reduced susceptibility. MIC_{50} and MIC_{90} values were either identical or differed by a dilution for most antimicrobials tested. The antibiotics with the higher ratio of non-WT strains were penicillin (97%), tetracycline (91%) and clindamycin (90%). Conversely, non-WT strains ranged between 3-6% when oxacillin, cefazolin, ceftiofur and rifampin were tested.

Discussion and Conclusion

The growing challenge of antimicrobial resistance necessitates for a rational use of antimicrobials in livestock. Consequently, antimicrobial susceptibility testing is crucial when treatment is required. Except for enrofloxacin and florfenicol, Italian strains exhibited higher prevalence of non-WT strains when compared with other recent studies conducted in Spain, Brazil and Denmark. The high level of non-WT strains for penicillin, tetracycline and clindamycin could be ascribed to selective pressure following antibiotic exposure for the treatment of other diseases. In the future it would be interesting to correlate phenotypic resistance with its genetic determinants.

BBD-PP-60

STUDY ON THE DYNAMICS OF CIRCULATION OF LAWSONIA INTRACELLULARIS IN 10 PIG FARMS. RELATIONSHIP WITH BIOSECURITY LEVEL. EFFECTS ON DIARRHEA AND TECHNICAL PERFORMANCES

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Background and Objectives

Lawsonia intracellularis (L.i.) is present in most pig farms. Infection timing and intensity affect technical and economic performance. This study evaluated L.i. circulation dynamics in ten farms and their relationship with biosecurity, diarrhea presence and performance.

Material and Methods

Ten farms without hemorrhagic ileitis and without antibiotic treatment for ileitis were assessed. L.i. dynamics were measured using ELISA on serum and PCR on saliva at three fattening ages: Age 1 (2–4 weeks after beginning of fattening period), Ages 2 and 3 (older batches with an interval of three or five weeks between batches). Combining ELISA and PCR defined six circulation profiles: 1) none, 2) low, 3) intense early, 4) intense mid, 5) intense late, 6) intense throughout fattening period. Biosecurity scores and diarrhea presence/absence scores were also recorded.

Results

Three farms had respectively for each group a profile 3, a profile 4 and a profile 6. One farm had a profil 1. No relationship between dynamics of infection and level of biosecurity or between dynamics of infection and scoring of diarrhea were found. The comparison of technical results between profil 1 and profil 4 vs profil 3 and profil 6 showed a difference of average daily gain (ADG) = 14 g and of feed conversion (FC) = 0,185.

Discussion and Conclusion

This study confirms that level of biosecurity or presence/absence of diarrhea are not sufficient to provide a display of the dynamics of circulation of L.i. in a farm. Laboratory sample analysis is necessary to evaluate this dynamics and to detect subclinical cases of ileitis which are the most important manifestation of L.i.. The incidence is particularly important on technical parameters as FC for the farms which have an early circulation of L.i. during fattening period in our results.

BBD-PP-61

PREVALENCE OF THE VT2E GENE AND ITS ASSOCIATION WITH HEALTH PARAMETERS IN GERMAN SWINE FARMS

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Background and Objectives

Verotoxin 2e (VT2e), a key virulence factor of Verotoxin-producing Escherichia coli, is the primary cause of edema disease (ED) in weaned piglets. While acute clinical cases of ED are well-documented, comparatively little attention has been paid to the role of Verotoxin-Associated Syndrome (VAS), which, in addition to acute clinical cases, also encompasses non-pathognomonic presentations or subclinical presentations. The aim of this study was to investigate the prevalence of the VT2e gene in German swine farms without acute clinical signs of ED and examine potential associations between gene presence and farm-level health parameters.

Material and Methods

A total of 165 oral fluid (OF) samples were collected from 33 farms using cotton ropes, targeting pigs up to 25 weeks of age. Out of all samples, 47% were obtained from pigs younger than 8 weeks, 39% from pigs aged 9–12 weeks and 14% from pigs older than 12 weeks.The oral fluids were analysed via RT-qPCR (POSδ38.5). Additionally, farm-specific data on health and production parameters were gathered through standardised questionnaires completed by farmers and veterinarians.

Results

VT2e was detected in at least one sample on 85 % of farms, and 62 % of all samples were tested positive. Among these, 42 % showed Ct values > 31, suggesting low to moderate toxin levels. No associations were found between VT2e prevalence and production type or general management practices. However, farms reporting unsatisfactory growth performance (9 farms), problems with ear necrosis (22 farms), or post-weaning diarrhoea (17 farms) showed a higher frequency of VT2e-positive samples.

Discussion and Conclusion

These findings suggest that VT2e is widespread, even without classical ED symptoms, and highlight the need to consider VT2e as a possible hidden factor in low-performance herds. Further research is required to investigate the underlying mechanisms and assess the potential of VT2e vaccines to enhance herd health and productivity and thereby reducing antimicrobial dependence.

BBD-PP-62

ISOLATION OF ACTINOBACILLUS ROSSII FROM MULTIPLE LITTERS FROM AN OUTBREAK OF ABORTIONS ON A PIG HERD IN ENGLAND

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Background and Objectives

Previously, Actinobacillus rossii has been isolated sporadically from individual aborted litters submitted to APHA. In 2025, A. rossii was isolated from piglets in multiple litters from one farm.

Material and Methods

Submissions were for voluntary Government-subsidised diagnostic testing, through the GB scanning surveillance network. Investigations involved clinical history taking, postmortem examinations, bacteriology, virus testing and histopathology.

Results

An outdoor breeding herd in the East of England described abortions affecting 3.5% of two successive batches due to farrow in three to seven weeks. Six litters of foetal material were examined. Bacterial culture of foetal stomach contents (FSC) of eight piglets from four submissions isolated light to very heavy growths of A. rossii in purity or mixed flora. Identity was confirmed by MALDI ToF sequencing. Heavy growths of Streptococcus suis in mixed flora were also recovered from piglet FSC in two submissions with A. rossii also detected; S. suis isolates were serotype 12 and serotype 28. No other abortifacient agents were detected by diagnostic testing including pathogenic Leptospira, porcine reproductive and respiratory syndrome virus, porcine circovirus 2 and 3 and parvovirus. A mild necrosuppurative placentitis was confirmed in two placentae from one submission; a Gram stain highlighted bacterial colonies characteristic of Actinobacillus spp (Gram-negative pleomorphic rods and coccobacilli) and a smaller number of Gram-positive ovoid cocci in short chains and pairs (resembling Streptococcus or Staphylococcus species).

Discussion and Conclusion

A. rossii and S. suis are normal inhabitants of the porcine vagina but may cause abortion through ascending infection, or haematogenous infection for S. suis. Holyoake and Thompson (2017; https://doi.org/10.1111/avj.12652) described isolation of A. rossii from an abortion outbreak in Australia from one piglet. To our knowledge, this case represents the first time A. rossii has been isolated from multiple piglets across several litters from one herd. Potential factors underlying an increase in bacterial abortions were explored but not identified.

BBD-PP-63

ENTEROTOXIGENIC E. COLI (ETEC) ISOLATES IN COMMERCIAL FINNISH PIGGERIES 2020-2025

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Background and Objectives

Escherichia coli is a pathogen responsible for multiple diseases in pigs, including neonatal and post-weaning diarrhea, edema disease, septicemia, polyserositis, and urinary tract infections. Antimicrobial resistance in enterotoxigenic E. coli (ETEC) has varied over time but remains high in Finland for antimicrobials commonly used in swine production, highlighting the importance of continuous surveillance. According to the European Medicines Agency, pigs represent the animal group with the highest antimicrobial use in Europe, and in Finland, they rank second after cattle.

Material and Methods

This study describes the current occurrence and characteristics of enterotoxigenic ETEC in Finnish commercial pig farms. Fecal samples from 94 farms with diarrhea were examined in the Finnish Food Authority between 2020 and 2025. Samples were collected either rectally from live animals or post-mortem from intestinal contents. Most of the samples were pooled from several piglets living in the same pen. In total, 267 ETEC isolates were obtained and subjected to antimicrobial resistance testing. Genotyping of ETEC isolates was performed by conventional PCR to detect genes encoding enterotoxins (LT, ST1, ST2) and fimbrial adhesins (F4 or F18).

Results

267 E. coli isolates were obtained across six farm types: fattening units, nursery units, multisite farms, breeding farms, and piglet production farms. Piglet production farms were the most common source, covering 135 isolates. The two predominant toxin–fimbria combinations identified were ST1–ST2–F18 (77 isolates) and LT1– ST2–F4 (126 isolates). According to literature, both F4 and F18 fimbria types are frequently found in piglet diarrhea in several countries.

Discussion and Conclusion

A substantially larger and more comprehensive collection of samples from farms is needed to enable reliable conclusions about antimicrobial resistance trends in Finland. However, the findings from this study will guide our subsequent project investigating bacteriophage therapy as an alternative to antimicrobials for controlling ETEC-associated diarrhea in pigs.

BBD-PP-64

FIRST MOLECULAR DETECTION OF STREPTOCOCCUS SUIS, GLAESSERELLA PARASUIS, AND ACTINOBACILLUS PLEUROPNEUMONIAE IN PIG HERDS FROM COSTA RICA, PRELIMINARY RESULTS.

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Background and Objectives

Streptococcus (S.) suis, Glaesserella (G.) parasuis, and Actinobacillus pleuropneumoniae (A.pp) are major bacterial pathogens involved in swine respiratory and systemic diseases. No scientific reports confirm the presence of these bacteria in Costa Rican pig herds. This study aimed to detect S. suis, G. parasuis and A.pp in pig herds in Costa Rica.

Material and Methods

Fluid samples (synovial and cerebrospinal), tissue samples (heart and lung), and swab samples (pleural, pericardial, and peritoneal) were collected from 52 diseased pigs from 11 pig herds. Sampled pigs showed neurological, respiratory, or locomotor disorders. DNA was analyzed by conventional PCR targeting the genes gdh of S. suis, 16S rRNA of G. parasuis, and apxIVA of A.pp, yielding amplicons of 695 bp, 821 bp, and 377 bp, respectively. PCR-positive products from selected farms were sequenced at Macrogen (South Korea).

Results

At the herd level, 82% (9/11) of farms were positive for S. suis, 73% (8/11) for G. parasuis and 91% (10/11) for A.pp. Sequencing confirmed S. suis–positive farms with 97.5–100%, G. parasuis with 96.3–99.7%, and A.pp with 98.8–99.47% identity to sequences reported from domestic pigs in other countries (Spain, China, Canada, Thailand and Germany). Half of the animals (26/52, 50%) were positive for at least one pathogen. Single infections were detected in 12/52 (23%) pigs, while coinfections occurred in 14/52 (27%) animals. Triple infection (S. suis + G. parasuis + A.pp) was detected in 4/14 (28%) animals.

Discussion and Conclusion

The results of S. suis, G. parasuis, and A.pp. in Costa Rican pig farms demonstrate that these pathogens are already established in the country and highlight the urgent need for surveillance to reduce clinical and economic losses.

BBD-PP-65

LUNG HEALTH STATUS OF THE BRAZILIAN HERDS: AN ASSESSMENT OF LUNG LESIONS TROUGH ABATTOIR SURVEILLANCE

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Background and Objectives

Mycoplasma hyopneumoniae (Mhyo) is an important respiratory pathogen that has a negative impact on the pig farming industry. The presence of this agent in herds results in reduced pig performance and poorer animal welfare. The most frequently used technique to investigate the potential involvement of Mhyo infection in herds affected by enzootic pneumonia (EP), both clinically and subclinically, is abattoir surveillance to score lung lesions. This study aims to present the lung health status of Brazilian herds through lung lesion scores related to EP.

Material and Methods

Ceva Lung Program methodology was used in this study, that included 101.000 lungs from 948 batches of pigs from 179 random farms from Brazil, evaluated between January-2025 and November-2025 in different slaughterhouses. For each batch the following parameters were calculated: Enzootic pneumonia index (Ep index), Broncho-pneumonic lungs (BPL), Affected surface out of all lungs (ASAL), Scars and Cranio Ventral Pleurisy (CVP).

Results

Of the 101,000 lungs evaluated, 49.51% presented bronchopneumonia lung lesions. The affected surface area of all lungs evaluated was 3.54%, while that of lungs lesions was 5.75%. The level of scarring reached 11.23% and cranial pleurisy was 3.17%.The EP index showed little variation throughout the year, with a minimum level of 1.31 in August and a maximum of 2.78 in September.

Discussion and Conclusion

Continuous monitoring of the respiratory health status of swine herds is essential to understand the dynamics of pathogenic agents and to guide more effective control strategies. Among the available tools, the lung scoring method – Ceva Lung Program (CLP) stands out for providing valuable information on lesions compatible with Mycoplasma hyopneumoniae, supporting more precise herd health decisions.

BBD-PP-66

MOLECULAR CHARACTERIZATION OF ETEC VIRULENCE FACTORS IN SAMPLES FROM CHILEAN SWINE PRODUCTION SYSTEMS

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Background and Objectives

Escherichia coli (E. coli) is a common component of the intestinal microbiota of pigs, however strains that acquire virulence associated genes characteristic of enterotoxigenic E. coli (ETEC), express heat-labile toxin (LT), heat-stable toxins (STa and STb), and fimbrial adhesins such as F4, F6 and F18. These virulence factors enable intestinal colonization and strongly associated with neonatal and post-weaning diarrhea. This study aimed to determine the presence of these virulence traits in diarrheic samples from swine farms in central Chile.

Material and Methods

Fifty diarrheic samples were analyzed: rectal fecal swabs in Stuart medium (n = 44) and bacterial cultures from small intestinal segments presenting catarrhal enteritis (n = 6). Samples were processed at the Swine Diagnostic Laboratory, following standardized protocols. DNA was extracted using QIAamp Fast DNA Stool or QIAamp DNA Mini Kit according to sample type. Eight virulence factors (STa, STb, LT, F4, F5, F6, F18, and F41) were evaluated by EXOPOL qPCR using EXOone E. coli virulence factor STa BASIC+ and STb BASIC+ kits.

Results

Enterotoxins STa, STb, and LT were detected in 6, 19 and 5 samples respectively. Fimbrial adhesins F4, F18 and F41 were identify in 1, 4 and 1 samples respectively. Co-occurrence virulence factors were observed as follows: STb + LT in 2 isolate, Sta + STb in 1 isolate, Sta, STb and F4 in 1 isolate, and STa, LT, and F18 in 3 isolates.

Discussion and Conclusion

The presence of enterotoxins and fimbrial adhesins impacts pigs' productive performance. The detection of F4 and F18 are typically associated with post-weaning diarrhea—although F4 can also be observed in neonatal cases—while F41 is classically linked to neonatal diarrhea (Luppi, 2017). STb was the most frequent toxin, consistent with prior studies (Dubreuil et al., 2016; Sato et al., 2016). Limited national literature underscores the need for further research.

BBD-PP-67

DIAGNOSTIC PROTOCOL FOR SWINE DYSENTERY. RESULTS FOR ISOLATION OF BRACHYSPIRA HYODYSENTERIAE AND ANTIBIOTIC SENSITIVITY TESTS (AST) WITH MIC.

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Background and Objectives

Swine Dysentery (SD) is a highly contagious disease affecting pigs, caused by Brachyspira hyodysenteriae (BHyo), leading to severe diarrhoea with blood and mucus, weight loss, poor feed conversion, and high mortality. The objective of this study is to test a protocol for the diagnostic of SD and provide the laboratory with viable samples to allow the culture of BHyo, and perform AST.

Material and Methods

13 farms with fattening pigs presenting bloody diarrhoea were selected. Diagnostic protocol is based on the recollection of faecal samples from pigs with diarrhoea with blood and mucous, that have not been treated with antibiotics or EDTA, for 14 days. Collection of faeces directly from the rectum. One pair of disposable gloves and one sterile cup per pig. At least 5 pigs per farm, from different boxes. Additionally one rectal swab with carbon medium per pig. Samples packed in an insulated transport box with 2 frozen gel blocks. Transport and delivery to the laboratory in less than 24h. Laboratory conducted individual PCR tests for Bhyo and Lawsonia intracellularis (LAW), bacterial culture for Bhyo, and AST with MIC for Tiamulin, Valnemulin, Tylvalosin, Lincomycin and Tylosin.

Results

All 13 farms were positive for PCR for Bhyo. 7 farms positive for PCR for LAW. Culture of BHyo was successful in 9 farms. AST results (sensitivity positive): Valnemulin 8 farms (range MIC 0,063-4,0 ⌈g/ml); Lincomycin 8 farms (4,0-32,0 ⌈g/ml);); Tylvalosin 6 farms (4,0-32,0 ⌈g/ml); Tiamulin 4 farms (0,063-2,0 ⌈g/ml); Tylosin 1 farm (16,0 ⌈g/ml)

Discussion and Conclusion

The diagnostic protocol was able to identify BHyo in 100% of samples, and successful culture in 75%, allowing AST and production of auto-vaccines. Key points to improve: number of samples per farm >=5, no antibiotic treatment >=14 days. Valnemulin and Lincomycin were effective in 86,6% of strains. Valnemulin not used. Lincomycin frequently used. No antibiotic was effective in 100% of BHyo strains.

BBD-PP-68

OCCURRENCE AND ANTIMICROBIAL RESISTANCE OF STREPTOCOCCUS SUIS IN COMMERCIAL PIG FARMS IN COSTA RICA

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Background and Objectives

Streptococcus suis is associated with meningoencephalitis and the porcine respiratory disease complex. In Costa Rica, laboratory-based surveillance data remain scarce, and there is no national monitoring program or regulation of antimicrobial sales. Antimicrobials are widely used in feed during production stage transitions, raising concerns about antimicrobial resistance. This study generates baseline data on the occurrence of S. suis in commercial pig farms and characterizes its antimicrobial resistance profile.

Material and Methods

Eight farrow-to-finish and three finishing farms from four provinces were included (n=11). Fifty-two post-weaning pigs aged five to ten weeks with neurological, respiratory, or locomotor signs were evaluated (n=52). Samples included blood, nasal swabs, cerebrospinal fluid, synovial fluid, and tissues from necropsied animals (n=21), yielding one hundred sixty-seven specimens (n=167). Bacterial isolation used conventional culture. Isolates were identified by Vitek2 and MALDI-TOF and confirmed by PCR targeting the gdh gene. Antimicrobial susceptibility testing was performed using the disc diffusion method with compounds commonly used on farms.

Results

Four of eleven farms (n=4/11) and five pigs (n=5/52) were positive for S. suis. Only 8 of167 specimens were culture positive, including clinically relevant isolates from cerebrospinal fluid (n=1), synovial fluid (n=2), heart (n=2), and lungs (n=3). Resistance was detected to tetracycline (n=4/4), tylosin (n=4/4), tilmicosin (n=4/4), and florfenicol (n=3/4), while susceptibility to ceftiofur, amoxicillin, and tiamulin was preserved. All positive farms routinely administered in feed antimicrobials during weaning, particularly amoxicillin and florfenicol, although this differed from the observed resistance profile. Serotyping was unavailable at submission.

Discussion and Conclusion

These preliminary findings provide baseline evidence on circulation and resistance patterns of S. suis in Costa Rican pig farms. The absence of national surveillance and regulatory control, combined with widespread antimicrobial use, underscores the need for integrated monitoring, harmonized diagnostics, and antimicrobial stewardship within a One Health framework. These data support future policy development.

BBD-PP-69

EFFECT OF A NOVEL ENDOTOXIN REDUCER ON WEANER PERFORMANCE AND INFLAMMATORY STATUS: A POTENTIAL STRATEGY FOR MITIGATING SINS?

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Background and Objectives

Lipopolysaccharides (LPS) are toxic molecules from the outer membrane of gram-negative bacteria. When absorbed into the bloodstream, they trigger inflammatory responses affecting performance. Swine Inflammation and Necrosis Syndrome (SINS) has been linked to LPS entering the systemic blood flow, causing widespread inflammation and necrosis in various body parts. Research has revealed that affected pigs show elevated blood levels of monocytes and neutrophils, potentially serving as biomarkers for SINS (Loewenstein, et al. 2022).
This trial aimed to evaluate the effect of an endotoxin reducer on weaner performance, inflammatory status, and SINS-associated biomarkers.

Material and Methods

A 42-day trial was conducted at a research facility (Philippines). The study involved 180 weaned piglets (LW-LR x PD, 28 days old, average weight of 7.5 kg) fed an antibiotic-free diet. Piglets were randomly allocated to 12 pens, with 6 pens randomly assigned to a control group (C) and 6 pens assigned to a group supplemented with an endotoxin reducer (ER) (EndoBan, Nutrex nv) at 500g per ton of feed. Initial and final body weights (BW) and daily feed intake were monitored throughout the trial at pen level. The final feed conversion ratio was calculated. On day 42, blood samples were collected from 3 pigs per pen to analyze malondialdehyde (MDA), hemoglobin (Hb), white and red blood cell counts, neutrophil and monocyte percentages to assess inflammatory and oxidative stress status. Statistical analysis was performed using ANOVA ($p<0.05$).

Results

By day 42, ER piglets showed higher BW (24.8kg vs. 24.3kg) and a significantly better FCR (1.45 vs. 1.66). All measured blood parameters were significantly improved in the ER group compared to the C group.

Discussion and Conclusion

These findings show that ER can improve performance and inflammatory status in weaners. Given that ER has demonstrated LPS binding capabilities in previous research and positively impacted SINS-related biomarkers in this study, further research should investigate its potential for mitigating SINS.

BBD-PP-70

EXPERIMENTAL INDUCTION OF THE ENZOOTIC PNEUMONIA USING LUNG HOMOGENATE INOCULATION IN SWINE

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Background and Objectives

Enzootic Pneumonia (EP) is one of the major health challenges in intensive swine production, characterized by infection of Mycoplasma hyopneumoniae (M. hyop.), interaction with other pathogens, as well as environmental and management factors. The objective of this study was to reproduce the EP through the inoculation of M. hyop. free pigs with a lung homogenate.

Material and Methods

Forty free-Mycoplasma hyopneumoniae pigs were vaccinated against M. hyop. and PCV-2 and intratracheally inoculated with a lung homogenate at 113 days of age. The homogenate was prepared with lungs that presented at least 15% cranioventral pulmonary consolidation (CVPC) and were positive for M. hyop. at qPCR. Fragments were selected, sectioned, 100mL of PBS was added, homogenized by pressing the fragments and stirring the volume, and then filtered through a sieve and sterile gauze. This process was repeated by adding 100mL of PBS, followed by a second filtration. The filtrates were pooled and transferred to a graduated cylinder, where the volume was adjusted to a final total of 300mL. For inoculation, animals were anesthetized and administered 5mL of the homogenate via the endotracheal route. At 139 days of age, all animals were euthanized for macroscopic lung lesion, qPCR, and ELISA evaluation.

Results

At slaughter, 39 lungs were evaluated (an animal died before), showing a pneumonia prevalence of 84.62% with a mean CVPC area of 17.78%. All lungs evaluated tested positive for M. hyop. at qPCR, and an increased concentration of anti-M hyop IgG was observed. In addition, a prevalence of 25.64% for pleurisy, 5.13% for pericarditis, and 35.90% for nodules and abscesses was observed.

Discussion and Conclusion

It can be concluded that exposure to lung homogenate induced the development of Enzootic Pneumonia in the swine. This study demonstrates that the technique used represents an effective, simple, practical, and rapid approach for experimentally reproducing the disease (FAPESP #2024/21712-3 / #2024/17201-3).

BBD-PP-71

EVOLUTION OF THE PREVALENCE AND SEVERITY OF LUNG LESIONS ASSESSED IN SLAUGHTERHOUSES IN SPAIN FROM 2016 TO 2025

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Background and Objectives

Slaughterhouse lung lesion scoring helps estimate respiratory disease prevalence. Common lesions include cranioventral bronchopneumonia linked to Mycoplasma hyopneumoniae, cause of Enzootic Pneumonia (Ep), and dorso-caudal pleuritis associated with Actinobacillus pleuropneumoniae (App). This study examines trends in prevalence and severity of Ep-like and App-like lesions in Spain since 2016.

Material and Methods

A total of 1.309.726 lungs from 8.187 batches from farms across Spain were evaluated between 2016 and October 2025 using the Ceva Lung Program methodology, scoring for Ep-like lesions using modified Madec grid, and dorso-caudal pleurisy to evaluate App-like lesions. Parameters calculated at batch level: Ep-like lesions: Broncho-pneumonic lungs (BPL) Average affected surface (AAS) Ap-like lesions: Dorso-caudal pleuritis (DCP) App_index (APPI) Trends were analysed using Spearman's correlation coefficient (r_s). Statistical difference was set at 0.05.

Results

Prevalence (BPL) and severity (AAS) of Ep-like lesions showed a progressive negative correlation over the years (r_s=-0.28; p<0.001) (r_s=-0.23; p<0.001), respectively. BPL decreased from 49.96% (IC95%=47.91-52.01%) in 2016 to 29.78% (IC95%=28.43-31.13%) in 2025, while AAS declined from 3.8% (IC95%=3.51-4.15%) to 1.93% (IC95%=1.76-2.10%) over the same period.

In contrast, App-like lesions showed no consistent trend in either prevalence (r_s=0.002; p=0.87) or severity (r_s=0.007; p=0.55). Prevalence (DCP) fluctuated between 10.02% (IC95%=9.26 -10.78%) and 23.22% (IC95%=22,27-24,17%), and severity (APPI) ranged from 0.29 (IC95%=0.27-0.31) to 0.60 (IC95%=0.58-0.63) without a clear pattern.

Discussion and Conclusion

EP control has improved over time, likely reflecting more effective prevention strategies. A temporary increase in EP-like lesions during 2021–2022 may relate to severe PRRS outbreaks caused by the Rosalia strain, which strongly affected farms in North-East Spain, the country's region with the highest pig density. In contrast, no consistent trend was observed for DCP, possibly due to the wide diversity of App serotypes and their variable control measures, highlighting the need for continuous surveillance.

BBD-PP-72

COMPARATIVE EVALUATION OF TWO VACCINATION PROTOCOLS AGAINST MESOMYCOPLASMA HYOPNEUMONIAE UNDER FIELD CONDITIONS.

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Background and Objectives

Mesomycoplasma hyopneumoniae (M. hyo) remains a key pathogen in the porcine respiratory disease complex (CRP) despite widespread vaccination. SoundTalks® (ST), a sound-based monitoring system, provides the Respiratory Health Status (ReHS) metric, which can detect respiratory issues up to five days before clinical outbreaks and correlates with sensitive diagnostic techniques as tracheobronchial scrapings. This study aimed to compare two vaccination strategies against M. hyo in fattening pigs by evaluating mortality and respiratory health indicators provided by ST.

Material and Methods

The trial involved 8,160 pigs positive for PRRSv and M. hyo, divided into 8 lots of 1,020 animals over 16 sow-farm production weeks. Animals were housed in four barns equipped with 12 ST monitors (3 monitors/barn). All pigs received a commercial M. hyo vaccine at weaning (21 days), and 50% received a booster at the start of fattening (63 days). Allocation was at barn level and alternated between batches. Mortality and respiratory health (ReHS and % green days) were recorded. ReHS ranges from 0–100, with green (100–61), yellow (60–41), and red (40–0); ReHS <60 indicates respiratory alarm. Statistical analysis was performed using Minitab®21.

Results

Boosted pigs showed significantly better respiratory health (average ReHS 58 vs. 31) and fewer alarm days (55% vs. 96%) compared to controls. Mortality decreased by 35% (4.3% vs. 6.6%). ReHS trends confirmed improved respiratory status in boosted groups, remaining above controls on 70% of monitored days (105/150).

Discussion and Conclusion

Under conditions of this study, a booster dose of M. hyo vaccine significantly improved respiratory health and reduced mortality, yielding an estimated ROI of 1:10 based solely on mortality reduction. Sound-based monitoring proved a valuable tool for objective health assessment and early disease detection. These findings highlight the benefits of booster vaccination in reducing clinical signs and improving production outcomes.

BBD-PP-73

PENICILLIN RESISTANT S. SUIS SEROTYPE 16 INFECTIONS IN PIGLETS FROM DANISH PIG FARMS

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Background and Objectives

Infection with Streptococcus suis (S. suis) is a well-known cause of bacteriaemia, arthritis and meningitis in young pigs in all pig producing countries. The predominant serotypes vary between countries and continents. The first choice of antimicrobial treatment is simple penicillin and historically all the Danish isolates of S.suis have been sensitive to penicillin.

Material and Methods

All S. suis isolates from routine diagnostic pathology at the Veterinary Laboratory Kjellerup, Denmark over a three-year period 2021-2023 were included. The isolates were serotyped and MIC tested (minimum inhibitory concentration). Isolates of S.suis serotype 16 in the following years were included for this study.

Results

A total of 346 S. suis isolates were isolated between 2021 to 2023. Type 2, 7 and 9 constituted 78 percent of the isolates. Serotype 16 were identified in 4 cases in 2021, none in 2022 and 2 cases in 2023. From January 2024 until November 2025 additional 11 cases were identified: 3 cases in 2024 and 8 cases in 2025. The 17 cases originated from 11 herds. Fifteen of the isolates originated from piglets with arthritis, while two were isolated from endocarditis. Sixteen of the seventeen isolates of S. suis serotype 16 were resistant to penicillin. Among all other Danish S. suis isolates from 2021-2025 less than 0.2% were penicillin resistant.

Discussion and Conclusion

The finding of penicillin resistant S. suis serotype 16 in piglets underline the importance of bacteriology and resistance profiles also in case of S. suis arthritis and septicemia. The available vaccine on the Danish market targets serotype ½ and serotype 2. In case of other serotypes, it is possible to use autovaccines produced specifically for the serotypes in affected pigherds.

BBD-PP-74

ACTINOBACILLUS PLEUROPNEUMONIAE SEROTYPES AND ASSOCIATION WITH ANTIMICROBIAL SUSCEPTIBILITY AND REGIONAL ORIGIN IN THE NETHERLANDS IN 2024

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Background and Objectives

Actinobacillus pleuropneumoniae (App) is the most frequently diagnosed cause of respiratory disease in Dutch finishing pigs. In the case that specific App serotypes are associated to antimicrobial susceptibility (AST) or geographical location, this information could aid decision making in veterinary practice. This study aimed to study the App serotype distribution and associations with AST and region of origin in the Netherlands.

Material and Methods

All App isolates from routine submissions to GD were serotyped using microtube-agglutination-test using antisera, kindly provided by MSD Animal Health. Non typeable or cross-reacting isolates or isolates of specific interest were subject to genetic analysis (GS). AST was performed using broth dilution. Strains were linked to region of origin, categorized as South or North of the Netherlands.

Results

From 98 isolates, 47% was serotype (st) 9 and 36% was st2. Other serotypes were st3 (5%) and st5b (4%) and st13 (6%).

Two non-typeable isolates were identified as st2 by GS. GS indicated that presumed st13 isolates were genetically either st7 or st18. Cross reacting isolates for st3 and st8 were genetically identified as st4. One st9 isolate had an insertion element in the apxIV gene that explains apxIV negative antibody ELISA testing on that farm.

AST of 61 strains revealed most strains to be susceptible for first choice antibiotics (tiamulin, penicillin and florfenicol). 87% was resistant to tetracycline, of which st9 isolates were more frequently resistant than st2.

App isolates obtained from the north were significantly more frequently identified as st2 and isolates from the south of the Netherlands as st9, in line with historical anecdotal information.

Discussion and Conclusion

In line with historical data (1985 and 2008), Dutch App strains are most frequently typed as st9 and st2. Slight differences in antimicrobial susceptibility between st2 and st9 strains were identified, without consequences for the first choice of antibiotics. GS analysis revealed some atypical isolates with potential relevance for animal health and surveillance.

BBD-PP-75

HALF-LIFE OF MATERNAL DERIVED ANTIBODIES AGAINST ACTINOBACILLUS PLEUROPNEUMONIAE APX-TOXINS AND OMPA PROTEIN IN A COMMERCIAL FARM

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Background and Objectives

Swine pleuropneumonia caused by Actinobacillus pleuropneumoniae (App) is an infectious disease of worldwide distribution that affects pig herds, causing disease outbreaks mainly in the growing and fattening units. Maternal antibodies (MDA) play an important role in the prevention of clinical disease in early ages. The objective of this work was to determine in a positive herd the half-life of MDA against different toxins and proteins of App.

Material and Methods

In an App-endemic commercial swine farm, 42 piglets from 7 sows were randomly selected and ear tagged at birth. Serum was sampled at 24 hours, and weekly, until the 10th week of life. These samples were analysed through five enzyme-linked immunosorbent assay (ELISA) tests against Apx toxins I, II, III (in-house tests), and IV and the OmpA protein (commercial kits), expressing the results in S/P value. So that the half-life of these antibodies could be determined as the time required to decrease 50% the s/p value detected at 24 hours of life.

Results

24 hours after birth, the following values were detected: for ApxI: 0.733 (IC95%= 0.505 – 0.960), ApxII: 2.907(IC95%=2.654 – 3.160), ApxIII: 1.098 (IC95%= 0.956 – 1.241), ApxIV: 1.677 (IC95%=1.555 – 1.800) and OmpA:1.173 (IC95%=1.011 – 1.336).The half-life determined for each type of antibodies was 9.56 days for ApxI, 35.49 days for ApxII, 11.79 days for ApxIII, 57.98 days for ApxIV and 17.8 days for OmpA.

Discussion and Conclusion

The half-life of these MDAs can vary depending on the antigen used in the test, the serotype present in the herd and the sensitivity of the test used, with half-lives of less than 2-3 weeks for antibodies against the toxins ApxI, ApxIII, and the OmpA protein, and higher half-lives for the rest. This difference in half-life and in levels could explain, at least in part, outbreaks that appear sooner than expected and should be considered when implementing vaccination protocols.

BBD-PP-76

SEROLOGICAL DETECTION OF ANTIBODIES TO DIFFERENT SEROGROUPS OF ACTINOBACILLUS PLEUROPNEUMONIAE IN SWEDISH GILT PRODUCING HERDS

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Background and Objectives

In Sweden, Actinobacillus pleuropneumoniae (APP) is present in most conventional and gilt-producing herds. During clinical outbreaks, serotype 2 is most frequently isolated. The objective of the study was to investigate the occurrence of different APP serotypes in Swedish gilt-producing herds.

Material and Methods

Serum samples (n:8) were collected from the age categories 10, 20 and 30 weeks in all gilt-producing herds (n: 14), in total 336 samples. The samples were analysed with an enzyme-linked immunosorbent assay (ELISA), detecting antibodies to APP1-9-11, APP 2, APP 3-6-8, APP 4-7, APP 5a&b, APP 5s, APP 10, and APP 12.

Results

In three herds, none of the investigated antibodies were detected. In two herds, antibodies to only one serotype were detected. In nine herds, antibodies to more than one serotype were detected. At 10 weeks of age, antibodies were only detected in one herd, at 20 weeks of age, antibodies were detected in six herds, and at 30 weeks of age, antibodies were detected in 11 herds. No antibodies were detected to serotypes 1, 9, 5a, 5b, and 5s. Antibodies to serotype 4 (n:65) were most frequently detected, followed by APP 3 (n: 34), APP 8 (n: 21), and APP 2 (n: 20). Antibody levels generally varied from levels just above the cut-off value to high levels. Antibodies to only one serotype were detected in 25 samples, and antibodies to multiple serotypes were detected in 53 samples. Samples could have antibodies for up to six different serotypes.

Discussion and Conclusion

The results are consistent with other studies where one individual develops antibodies to several serotypes. This is the first study to detect antibodies to serotypes 10, 11 and 12 in Sweden, indicating a diverse and changing situation. To monitor if other serotypes than APP 2 are involved in clinical outbreaks, samples collected from diseased lungs are of importance.

BBD-PP-77

THERAPEUTIC USE OF AMINOGLYCOSIDES FOR ESCHERICHIA COLI AND SALMONELLA SPP. INFECTION TREATMENT IN THE ERA OF PRUDENT USE CONCEPTS

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Background and Objectives

MIC data on apramycin (Apravet®), paromomycin and neomycin were compared over a time period of 6 years. The pharmacokinetics (PK) of apramycin small intestine concentration was related to the MICs (pharmacodynamics-PD).

Material and Methods

Antimicrobial susceptibility testing: MICs on apramycin, neomycin and paromomycin were derived from E.coli isolates (n=506) and Salmonella spp. isolates (n=177) from nine European countries using broth microdilution method according to CLSI.
Pharmacokinetics: Apramycin concentration in the intestine was determined after 21 consecutive days of feed administration. Samples were taken at day 21 and 12, 24, 36 and 48 hours after treatment stop.
Susceptibility monitoring: Susceptibility of E.coli/Salmonella spp. strains to aminoglycosides was evaluated over a time period of six years (2015-2020) to identify trends on susceptibility changes.

Results

MIC results reflecting a time-period of six years did not show an increase of MIC values in the case of E.coli. Decline of apramycin MIC_{90} (32 to 16µg/ml) and stable neomycin and paromomycin MIC_{90} (64µg/ml; 1024µg/ml) were determined. More narrow and mono-modal MIC distribution was found for apramycin. In contrast, MIC distributions for neomycin and paromomycin were broader with a trend to bi-modal MIC distribution.
Decline of apramycin MIC_{90} (8 to 4µg/ml) was also found for Salmonella spp. isolates. In contrast, a trend of MIC increase was determined for paromomycin and neomycin.
High apramycin intestine concentrations after administration at registered treatment dose were determined. The determined apramycin concentration was above the MIC_{90} of 95% of tested E.coli and 100% of tested Salmonella isolates.

Discussion and Conclusion

Susceptibility differences of E.coli and Salmonella spp. strains to three aminoglycoside antibiotics were found with MIC decline on apramycin. An excellent therapeutic effect of Apravet® in the case of oral E.coli and Salmonella spp infection treatment can be expected based on available PK/PD data.

BBD-PP-78

ANTIMICROBIAL RESISTANCE PROFILING OF STREPTOCOCCUS SUIS ISOLATES FROM NEUROLOGICAL CASES IN CHILEAN PIGS

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Background and Objectives

Streptococcus suis is a Gram-positive coccoid bacterium that commonly inhabits the upper respiratory tract of pigs. However, it can cause diseases such as meningitis or arthritis, and its zoonotic potential poses a risk to humans. Due to prophylactic and therapeutic use of antibiotics, this bacterium has increasingly exhibited resistance to various antimicrobial agents. In this case report, we evaluated whether S. suis strains were resistant to the most commonly used antibiotics for its control.

Material and Methods

Two pigs from a swine farm in the south-central region of Chile, presenting neurological signs, were necropsied. Samples were collected from brain and spinal cord swabs in pig 1, and from brain and lung in pig 2. The samples were cultured in brain-heart infusion broth, MacConkey agar, blood agar, and chocolate agar, followed by antimicrobial susceptibility testing.

Results

Streptococcus suis was identified in the brain samples of both animals. One isolate was sensitive to Gentamicin and Trimethoprim/Sulfamethoxazole, moderately sensitive to Neomycin, Danofloxacin, Tiamulin and Tulathromycin, and resistant to Clindamycin, Tilmicosin, Tylosin tartrate, Sulfadimethoxine, Oxytetracycline, Chlortetracycline, Spectinomycin, Ampicillin/Amoxicillin, Ceftiofur, Penicillin, Florfenicol and Enrofloxacin. The second isolated was sensitive to Gentamicin and Danofloxacin, and resistant to all the other antibiotics tested, using the SENSITITRE® to MIC detection.

Discussion and Conclusion

The zoonotic nature of S. suis and its capacity to cause severe clinical manifestations, together with its growing acquisition of antimicrobial resistance, make it a significant subject of study. Its global distribution and large number of serotypes contribute to its pathogenicity. These results are consistent with studies in Asia, where penicillin, oxytetracycline, and florfenicol have also shown resistance (Dong, C. et al., 2022), although other studies report variable resistance percentages (Baez, M. et al., 2012). These findings support the need for further investigation into the evolution of resistance and the bacterial mechanisms that must be addressed for effective control.

HHM-PP-01

POSTPARTUM DYSGALACTIA SYNDROM: CAN RISK PRACTISES BE IDENTIFIED IN AFFECTED PIG FARMS?

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Background and Objectives

Postpartum Dysgalactia Syndrome (PDS) remains common in sow herds. Prevention is difficult due to its multifactorial etiology involving hormonal disturbances, stress, digestive or general health disorders. This study aims to update information about prevalence, characteristics of PDS affected herds and potential associated risk factors.

Material and Methods

We conducted telephone surveys on 55 French pig farms, with or without regular occurrence of PDS. Herd characteristics and technical results were collected. Farmers self-declared PDS clinical signs (nature, severity, prevalence) and treatments. Questions about management focused on known published risk factors. We studied three groups with different rates of severe cases: PDS– (no cases), PDS+ (occasional), and PDS++ (frequent). Descriptive, univariate statistical analysis was performed.

Results

“Control” group (PDS–, n=12) was underrepresented compared with “occasionally” (PDS+, n=18) or “frequently” affected herds (PDS++, n=25). The three groups had similar average herd sizes. Their reproductive performance (fertility rates and litter size at weaning) did not differ, but sows from PDS+ and PDS++ herds had more total born (TB) than PDS- herds (respectively 17.0, 16.9, and 16.0, $p=0.03$) and more live-born per litter ($p=0.05$). Analysis showed that 30% of the questions discriminated the 3 groups ($p<0.20$). The largest number of significant factors related to health (eg. anemia $p=0.03$) and nutrition management (eg. liquid feeding $p<0.01$, fibrous diet pre-farrowing $p=0.015$) were more frequent in PDS+ and PDS++.

Discussion and Conclusion

Given the limited sample size, the imbalance between “control” and “affected” groups, the imprecision of declarative information, variable farmers expertise and ability to reach higher TB, the causative inference should be cautiously interpreted. This descriptive study supports the hypothesis of a multifactorial origin involving risk factors related to health, nutrition, hygiene, and management. Results suggest that risks related to inflammatory status (lameness, bite injuries) and liquid feed (hygiene, dilution, quantities) remain to be explored.

HHM-PP-02

CAN INTRAVAGINAL AND INTRAMUSCULAR SENSORS BE USED TO DETECT FEBRILE STAGES IN PERIPARTUM SOWS?

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Background and Objectives

Sow health monitoring at farrowing usually relies on animal observation and rectal temperature measurement. However, rectal temperature can be affected by several factors, such as time, operator, equipment and measurement depth.

Material and Methods

In this study, data loggers (Anipill®) were tested to enable continuous recording of body temperature. A total of 12 sows at 80 days of gestation were implanted with data loggers in the brachiocephalic muscle (T_{im}; 1 measurement/5min) and in the vagina (T_{iv}; 1 measurement/15 min). At the same time, rectal temperature (T_{rec}) was measured 1 to 3 times per day.

Results

Temperature variations were observed among sows, physiological stages, and sensor types. Values ranged from 36.1°C to 40.2°C for T_{im}, from 37.2°C to 40.2°C for T_{rec} and from 37.8°C to 40.3°C for T_{iv}. When all physiological stages were combined, vaginal temperature (T_{iv}) (38.8°C ± 0.55°C) and rectal temperature (T_{rec}) (38.6°C ± 0.64°C) were strongly correlated (r^2= 0.78; $P < 0.01$; n=303). Muscle temperature (T_{im}) (38.3°C ± 0.71°C) was also significantly correlated with T_{rec}, although to a lesser extent (r^2 = 0.34; $P < 0.01$; n=390).

Discussion and Conclusion

Data loggers confirmed that body temperature rises at farrowing and during the lactation period, with clear daily fluctuations. According to this study, the intramuscular sensor is inaccurate and too invasive for practical use in pig farms. In contrast, the intravaginal sensor provides a minimally invasive and reliable method for monitoring sow body temperature. It appears to be a promising tool for detection of febrile sows and supporting their management around farrowing.

HHM-PP-03

EVALUATION OF INFRARED CAMERAS FOR MONITORING THE PERI-PARTUM TEMPERATURE IN SOWS

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Background and Objectives

Monitoring the peri-partum temperature is essential to prevent pathologies in sows, but using rectal thermometers is time-consuming. The objective of this study was to compare a rectal thermometer to two thermal cameras : a portable infrared camera (E6) and a thermal camera for smartphones (One Pro).

Material and Methods

Sows were measured on a commercial farm during 4 consecutive days, twice daily, using three tools simultaneously: a rectal thermometer, a portable infrared camera (E6) and a smartphone thermal camera (One Pro), resulting in a total of 508 measurements. 36 sows were repeatedly measured and data were retrospectively classified into four peri-partum stages: more than 16 h before parturition, from 16 h to 1 h before parturition, from 1 h before to 24 h after parturition, and more than 24 h after parturition. Maximum temperatures of the ano-vulvar area were extracted from thermographic images using commercial software.

Results

Infrared temperatures, especially those obtained with the One Pro camera, showed higher coefficients of variation than rectal temperatures. A significant increase in temperature was observed around farrowing ($P<0.001$), with a peak from −1 h to +24 h: +0.9°C for rectal temperature, and +0.6°C and +0.7°C for E6 temperatures measured at the anus and vulva, respectively. Rectal temperatures were more strongly correlated with E6 measurements ($r=0.60$ for anus and $r=0.50$ for vulva, $P<0.001$) than with One Pro measurements ($r=0.38$ for anus or vulva, $P<0.001$). Within each camera, temperatures measured at the anus and vulva were strongly correlated (intra-camera correlation; maximum $r=0.92$, $P<0.001$), whereas correlations between cameras were weak (maximum $r=0.37$, $P<0.001$).

Discussion and Conclusion

Considering these results, the E6 camera appeared to be the most reliable infrared tool. Thermography using this device could therefore represent a practical and non-invasive alternative to rectal temperature measurement for monitoring peri-partum hyperthermia in sows.

HHM-PP-04

FACTORS INFLUENCING IMPLEMENTATION OF BIOSECURITY BY FRENCH PIG BREEDERS

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Background and Objectives

Despite mandatory training courses, biosecurity audits and the many support offered to breeders, compliance with biosecurity measures is not always achieved. The aim of this study is to have a better understanding of the obstacles and expectations to improve biosecurity.

Material and Methods

317 French pig breeders (including 77 outdoor farms) voluntarily responded to an online survey consisting of 18 closed-ended questions on obstacles and the difficulties for implementing biosecurity.

Results

The ASF risk perception depends on the type of farm: 87% of the indoor breeders believe that the risk of having ASF in wild boars in France within a year is high, against 53% for outside breeders. For 40% of the breeders, to have ASF in France would improve their biosecurity compliance. Breeders say they are sufficiently informed about biosecurity (97%). Nevertheless, some breeders expect other types of advice: frequent reminders of biosecurity instructions, training, audits, meetings on biosecurity.In terms of motivation, some perceive biosecurity as a constraint imposed by French regulations. Others consider that some measures are not adapted to their farm or are not convinced of their usefulness. 35% of breeders said that if they were convinced of the usefulness of a measure, they would apply it.The biosecurity measures for which breeders cited the most difficulty are the farm areas (internal and external), the vehicles routes and the fences. The biosecurity measures for which the fewest difficulty are quarantine, loading bay and cleaning-disinfection.The obstacles of biosecurity are building structures and farm organisation for 29% of the breeders, working time and organisational constraints (17%), the cost of measures (15%) and not being convinced of the usefulness of the measure (7%).

Discussion and Conclusion

The importance given to the different biosecurity measures differs between outdoor and indoor farm. Understanding the obstacles and expectations of farmers allows for the adaptation of biosecurity advice.

HHM-PP-05

THE IMPACT OF A ONE-TIME CLEANING AND DISINFECTION OF WATER LINES ON WATER QUALITY AND BIOFILMS IN SIX SWINE FARMS IN THE UNITED STATES

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Background and Objectives

Poor water quality and waterline biofilms in farms present challenges in maintaining biosecurity, impact water medication administration, and can restrict access to drinking water. Mitigations to improve these challenges are available; however, there is a lack of knowledge on best practices for waterline cleaning and disinfection, as well as their potential impact on pig health and performance. The objectives of this study were to evaluate the impacts of a one-time administration of 0.78% peracetic acid (PAA) on water quality, biofilms, and biofilm regrowth dynamics.

Material and Methods

Six, 2400 head, wean-to-finish sites in the United States on well water were enrolled into this longitudinal study. Water (W) and waterline samples (WLS) were collected aseptically pre-treatment (0), 24 hours after PAA application following line flushing (1), and at 3, 5, 7, 14, 21, 42, 56, and 77 days post-treatment. Biofilm quantities were assessed via standard plate counts. Water samples were collected from the well and from two rooms. A comprehensive water quality assessment was performed for each water sample.

Results

Biofilm quantities from WLS ranged from 0 colony-forming units (CFUs)/mL to 3.3 billion CFUs/mL. PAA significantly reduced biofilm ($p<0.001$) compared to pre-treatment with an average 3.38 log reduction. Biofilms did not show significant differences from pre-treatment values 3 days post-treatment, with biofilm quantities peaking by day 7. PAA application did not significantly alter most chemical water quality parameters between pre- (0) and post-treatment (1). Results demonstrate that W samples from rooms had significantly higher average coliform counts than those present in W samples at the well.

Discussion and Conclusion

This research demonstrates that significant biofilm burdens in waterlines exist and can compromise overall water quality. One-time applications of 0.78% PAA had an impact; but however, increasing the PAA dose and applying continuous waterline treatment may need to be considered to manage waterline ecology long term.

HHM-PP-06

META-ANALYSIS OF CLOSTRIDIUM BUTYRICUM SPORE SUPPLEMENTATION IN DANISH PIG HERDS: REDUCTION OF SALMONELLA SEROPREVALENCE AT SLAUGHTER

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Background and Objectives

Salmonella remains a major zoonotic pathogen in pig production, posing significant food safety risks in Europe. The European Food Safety Authority attributes a substantial proportion of human salmonellosis to pork, emphasizing the need for effective on-farm control. Probiotics have emerged as antibiotic-free strategies to enhance gut health and reduce pathogen load. This meta-analysis evaluated the impact of supplementing pig feed with viable Clostridium butyricum spores (Miya-Gold®) on Salmonella antibody prevalence in meat juice and serum samples collected at slaughter from five Danish farms.

Material and Methods

Data were combined from five independent farm trials (2023–2025), each supplementing C. butyricum during the grower-finisher phase at 2.5×10^{11} CFU/ton feed. Pre- and post-intervention groups were compared under standard production conditions. Salmonella exposure was assessed using the Danish in-house ELISA on meat juice or serum, with samples of optical density (OD) >10 classified as positive. Statistical analysis employed a generalized linear mixed-effects model, with treatment as fixed effect and farm as random intercept.

Results

Across 495 samples, Salmonella seroprevalence declined from 36.0% pre-supplementation to 19.6% post-supplementation. The model confirmed a significant reduction ($p < 0.001$), with an odds ratio of 0.43 (95% CI: 0.29–0.65), indicating pigs were 1.84 times less likely to test positive after treatment. The reduction was consistent across farms, irrespective of herd size or baseline infection pressure.

Discussion and Conclusion

C. butyricum supplementation (Miya-Gold®) significantly reduced Salmonella seroprevalence in Danish pig herds. Likely mechanisms include improved gut microbiota balance, pathogen exclusion, and strengthened intestinal barrier integrity (1). These findings support probiotic supplementation as a practical, antibiotic-free tool to enhance herd health and reduce zoonotic risk in pork production.

HHM-PP-07

UPDATED REGIONAL ASSESSMENT OF PRDC PATHOGENS USING LUNG LESION SCORING AND SCREENING PCR

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Background and Objectives

To effectively tackle Porcine Respiratory Disease Complex (PRDC), it is often essential to assess lung lesions at slaughter and identify causative pathogens. This study combines pathoanatomical lung examination with PCR to detect key PRDC agents in slaughter pigs from Germany, the Netherlands, Belgium, and Austria. It serves as an update to regional findings from 2024.

Material and Methods

In total, 307 farms with low to high respiratory problems were included. Lungs were scored according to Ceva Lung Program methodology. Within each batch, the investigator selected up to five lungs and sampled the transition area between healthy and affected parenchyma. Pooled samples were then analyzed by a screening-PCR for following pathogens: Actinobacillus pleuropneumoniae (App), Mesomycoplasma hyopneumoniae (M.hyo), Betaartevirus suid 1+2 (PRRSV 1+2), Swine influenza A virus (swIAV) and Porcine circovirus type 2 (PCV2). The latter pathogen was genotyped at ct-values δ32.

Results

M.hyo was found on average in 258 (84.0%) farms, followed by PCV2 (149; 48.5%), PRRSV1 (105; 34.2%), App (28; 9.1%), PRRSV2 (15; 4.9%) and swIAV (15; 4.9%). In total, 64 farms (20.9%) were sequenced for PCV2. Most prominent genotype was PCV2d (81.3%), followed by PCV2a (12.5%) and PCV2b (6.3%).

Discussion and Conclusion

Compared to our previous evaluation, this study included five times more farms and revealed a lower prevalence for M.hyo (84.0% vs. 90.2%) and PRRSV1 (34.2% vs. 47.5%). App, PRRSV2, and swIAV remained the least prevalent agents. Interestingly, PCV2 was found more frequently (48.5% vs. 45.9%), with a notable increase in the identification of the PCV2d genotype (81.0% vs. 69.2%). These changes may be attributed to the larger number of farms included, differences in their geographic distribution, and a potential shift in pathogen epidemiology. Taken together, these findings suggest that PCV2, particularly the PCV2d genotype, is still on the rise, warranting close monitoring and potentially adapted control strategies.

HHM-PP-08

WHAT IS THE PERSPECTIVE OF FRENCH TECHNICAL ADVISORS ON BIOSECURITY IN PIG FARMING?

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Background and Objectives

The biosecurity compliance in pig farming could be improved. The aim of this study is to understand the opinion of French technical advisors regarding biosecurity in pig farming.

Material and Methods

68 technical advisors, veterinarians and technicians, voluntarily responded to an online survey on obstacles and the difficulties for implementing biosecurity in 2024. The survey contained 18 closed questions

Results

The ASF risk perception is high for technical advisors: 93% believe that the risk of having ASF in wild boars in France within a year is high. Technical advisors are sufficiently informed about biosecurity (97%) and ASF (93%).All biosecurity items are considered important or very important by more than 76% of technical advisors, with differences between items: 76% delivery and entry rules for equipment as very important to 100% doing so for entry room and rules for people entering the farm. Only two items are considered unimportant by a small minority: rendering management (1%) and quarantine (4%).Technical advisors believe that the main factors that would improve biosecurity are having ASF in France (69%), being convinced of the measure efficacity (52%), official inspection by veterinary services (49%) and commercial specifications (22%).They cite the main obstacle to implementing biosecurity to be building structures and farm organization. For fences, costs are cited as an obstacle by 90% of them. Time and work organization are also frequently mentioned, although less often than costs. Not being convinced of the effectiveness of a measure is also frequently cited, in around 20% of cases.

Discussion and Conclusion

Technical advisors have a higher perception of risk than breeders and attach greater importance to all biosecurity measures. They cite many more obstacles than breeders, likely due to the diversity of farms they support. In conclusion, the opinions of technical advisors closely align with those of farmers, although they tend to be somewhat stronger.

HHM-PP-09

CHOICE OF CONTROL METHODS TO VALIDATE THE CLEANING AND DISINFECTION OF PIG TRANSPORT LORRIES

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Background and Objectives

Transporting pigs is a major risk for the spread or introduction of disease such as African Swine Fever (ASF). Animal transport may also influence the transmission of food-borne zoonotic agents. Effective cleaning and disinfection (CD) of lorries, together with appropriate quality control, is therefore essential. The aim of this study was to evaluate the value of different methods for assessing CD effectiveness that can be applied routinely, as well as indicators relevant for verifying virus elimination.

Material and Methods

Seven CD control methods were evaluated: PCR assays targeting two biomarkers (porcine adenovirus and Clostridium spp.), visual cleanliness scoring, residual adenosine triphosphate (ATP) measurement, total bacteria count on Petri dishes, biofilm detection by staining, and a rapid colorimetric test for protein detection. Ten sites on each of 30 lorries were sampled after CD on adjacent surfaces. Results from all methods were compared.

Results

Correlation between methods was variable and generally weak, with no method proving fully satisfactory on its own. Biofilm staining did not correlate with any of the other methods. Visual scoring, Clostridium PCR and the protein detection test gave similar results. Total bacteria count and ATP measurement yielded relatively similar results and may be suitable microbiological control tools. Porcine adenovirus PCR was a relevant indicator for determining the effectiveness of CD against viruses.

Discussion and Conclusion

CD quality control should begin with simple and rapid methods such as visual scoring or protein residue detection. If the first screening is satisfactory, a microbiological assessment may be then performed. Total bacterial count remains a simple and inexpensive indicator of bacteriological contamination. Porcine adenovirus PCR appears particularly useful for assessing viral removal, especially in the context of ASF risk mitigation.

HHM-PP-10

REAL-TIME MORTALITY INTELLIGENCE: RENDERING-BASED SYNDROMIC SURVEILLANCE IN CATALAN FINISHER PIGS

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Background and Objectives

Rapid detection of abnormal mortality trends is critical for swine health and production efficiency. Current surveillance approaches often rely on delayed diagnostic information, reducing their value for early intervention. This study assesses rendering records as a continuous, near real-time data source to support syndromic surveillance and early warning for finisher pig herds in Catalonia.

Material and Methods

Rendering submission records (kg collected per farm and day) and swine movements from January 2022 to December 2024 were collected in the all-in all-out finisher farm population (2486/5776) in Catalonia. Daily population at the farm was estimated combining the number of animals entered at the farm, a growth curve, and the estimated number of animals collected daily by the rendering company. Weekly mortality rates were calculated using the number of estimated animals in the farm at the beginning of the week and the estimated number of carcasses submitted to the rendering plant. A method that considered the standard deviations of mortality combining the effect of pig age, season and farm size was developed.

Results

The system monitored 20.9 million finisher pigs from 2486 farms, generating 368154 weeks of mortality observations and 15247 finishing cycles. The baseline weekly mortality averaged 0.28% (IQR:0.07–0.49), and the cumulative mortality was 3.25% (IQR:1.06-5.44). Heat waves or other climatic anomalies do not show direct relation with mortality variations. During the period of study, the model identified 6565 mortality signals, of which 2351 (35.81%), 1631 (24.84%), 904 (13.77%), 586 (8.93%), 839 (12.78%), 254 (3.87%), were during the first, second, third, fourth, fifth and sixth month of the finisher stage. The cumulative mortality per cycle between national (3.25%) and imported (3.39%) pigs was not statistically significant.

Discussion and Conclusion

This rendering-based system enables earlier detection of abnormal mortality patterns, complementing traditional surveillance and supporting faster, more informed health interventions across the finisher pig sector.

HHM-PP-11

IMPACT OF A BACTERIA-BASED PRODUCT ON THE MICROBIAL QUALITY OF LIQUID FEED FOR PIGS

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Background and Objectives

Spontaneous fermentations in liquid feed can compromise its microbial quality, potentially affecting the health and performances of pigs. Different strategies are employed to address this issue. This study evaluates the effect of a new technological additive included in Noli® BL comprising Lactococcus lactis and Bacillus subtilis strains. The protocol was assessed according to the evolution of the liquid feed microbiology.

Material and Methods

The product was administered in three fattening units, directly into feeding system, in one meal per physiological stage, at a dosage of 100 g/1000 L of liquid feed. After system cleaning, the product was applied daily for three days, then weekly thereafter. Microbiological analyses were performed on feed samples collected from troughs and feed drop points before and throughout the trial, up to the fourth month

Results

Results differed between farms using push-fed mash and push-fed water. In mash-fed systems, lactic acid bacteria level initially dropped after cleaning but recovered within three days, stabilizing at a high level. Coliforms level initially increased, then declined, reaching a low steady state after 10 days. In the water-fed system, lactic acid bacteria also decreased but recovered more slowly, while coliforms declined progressively. A statistically significant reduction in coliforms levels were observed during the second treatment period (D9 to M4) ($P<0.05$). The added strains were consistently detected in all samples.

Discussion and Conclusion

Post-cleaning analysis highlighted the influence of residual fermented material on microbial quality. Early and consistent bacterial supplementation promoted a rapid return to a stable microbial state, while continued but intermittent application helped maintain improved microbial quality. The added strains successfully colonized the feeding system, particularly at the feed drop points.Weekly incorporation of a specific bacteria-based product has been shown to positively influence the microbiological quality of the liquid feed.

HHM-PP-12

POOLING AND HERD SENSITIVITY FOR PRRSV MONITORING: FRIENDS OR FOES

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Background and Objectives

Worldwide breeding herd PRRSV monitoring strategy uses serum from 30 due-to-wean piglets tested in pools of five. Pooling allows testing more animals at lower cost but reduces individual sensitivity. This study aimed to assess the effect of pooling on individual and herd sensitivity (HSe).

Material and Methods

A total of 47 PRRSV-1 and 33 PRRSV-2 positive (Ctδ38) serum samples were grouped by Ct. Samples were serially diluted simulating pools of 5, 10, 20, 60 and 120 pools. Sensitivity was calculated for each Ct group and dilution range. A linear mixed model was built to estimate the effect of dilution on the Ct. HSe was estimated under five prevalence scenarios applying different sampling strategies: 30 animals grouped in pools of 5, 60 animals in pools of 10 and 120 animals in pools of 20.

Results

All initial serum samples with Ct<30 maintained a 100% sensitivity in all the dilutions except for one PRRSV2 replicate. On the other hand, samples with Ct>30 had lower sensitivity with larger pools in both PRRSV1 and PRRSV2. Linear mixed model equation showed a Ct increase per log10 dilution of 3.27 for PRRSV-1 and 3.73 for PRRSV-2. All sampling strategies achieved ε90% HSe at ε10% prevalence. At 2% prevalence, only 6 pools of 20 animals maintained >80% HSe. At <1%, none sampling strategy overcame 70% HSe

Discussion and Conclusion

Pooling can be the key for an effective surveillance strategy. Pooling 5-10 serums has no effect on sensitivity with samples with Ct<30 and moderate effect for Ct>30 in both PRRSV species. Based on our model, considering a worst-case scenario with a single positive sample (Ct 35), the maximum allowable dilution for PRRSV-1 and PRRSV-2 would be 1:8 and 1:6, respectively. Pooling serum samples compensates individual sensitivity loss with higher HSe, allowing a cost-effective monitoring at low-prevalence scenarios.

HHM-PP-13

TONGUE TIPS: SAMPLE MANAGEMENT FOR A MORE EFFICIENT PRRSV MONITORING

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Background and Objectives

Postmortem tongue tips (TT) or tongue tips fluid (TTF) samples have become a reliable matrix to monitor PRRSV-positive swine herds (Baliellas et al., 2021). However, when liquid extracted from TT is insufficient, PBS is added, causing a dilution effect and therefore a decrease in sensitivity. Adding a freezing-thawing cycle is used in other matrices to increase the final volume. Thus, the objectives of this study were to evaluate the effect of sample preservation, fresh vs freezing-thawing, on the final TTF obtained (volume and PCR result).

Material and Methods

A total of 207 tongue-tips from stillborn piglets preserved fresh in 18 filter-bags, and 54 tongue-tips frozen-thawed in 10 filter-bags were analysed in this study. For each bag containing a known number of tongues, the initial weight and the fluid produced was recorded. The average volume produced per gram of tongue tip was calculated (ml/gr) and compared (Wilcoxon test), and the correlation between weight and volume was calculated. The dilution effect was quantified.

Results

Frozen-thawed samples exhibit a significantly ($p<0.05$) higher liquid production per gram compared to fresh storage samples, 0.07±0.021ml/g versus 0.029±0.022ml/g, respectively. A strong linear correlation ($R^2=0.9985$) between fresh TTF liquid weight and volume was observed. $y=1.0119x-0.0293$. Preliminary results suggest a dilution effect on Ct between 3.5 and 5 Ct for each $\log^{10}$ dilution

Discussion and Conclusion

Tongue tips from dead piglets have demonstrated being an alternative for PRRSV monitoring, showing high sensitivity compared to serum. However, when perinatal mortality remains low, the liquid obtained from samples available could be insufficient for RT-PCR analysis (±250⌈L). Our results demonstrate that applying a frozen-thawed treatment duplicates the volume, needing only 3-4 grams of tongue tissue to obtain enough fluid to perform an RT-PCR, compared to 10-11 grams needed from a fresh sample. This approach minimizes sample size requirements and avoids sensitivity losses by dilution.

HHM-PP-14

LAWSONIA INTRACELLULARIS SUBCLINICAL INFECTION: HISTORICAL COMPARISON OF TECHNICAL AND ECONOMIC RESULTS BEFORE AND AFTER VACCINATION OVER TWO IDENTICAL PERIODS OF THE YEAR

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Background and Objectives

Lawsonia intracellularis (L.i.) infections are prevalent in pig herds worldwide. While acute and chronic clinical forms are well known, the impact of subclinical ileitis is less clear. This study describes technical performance and economic results following vaccination in a herd suspected of subclinical L.i. infection.

Material and Methods

A farrow-to-finish herd with strong PCR and ELISA positivity for L.i., but without clinical signs and without specific antimicrobials or prior vaccination, was enrolled. Piglets were vaccinated at weaning with Porcilis® Lawsonia so that 100% of slaughtered pigs were vaccinated for at least one semester. Technical data included slaughter weight (SW), age to market (ATM), loss rate (LR), 8-115Kg standardized average daily gain ($_{8\text{-}115}$ADG) and 8-115Kg standardised feed conversion index ($_{8\text{-}115}$FCI). Clinical and post-mortem observations were monitored by the herd veterinarian. Outcomes from the vaccinated and "control" semester were compared. Economic impact was estimated using GT-Direct, the online tool from the French Pig Industry Office (IFIP).

Results

2197 vaccinated pigs slaughtered in the first semester of 2025 were compared with 2055 non-vaccinated pigs slaughtered in the first semester of 2024. In vaccinated animals, the veterinarian recorded more homogeneous batches, less losses with gastric ulceration and/or intestinal torsion, and fewer flank bite wounds in finishing. Regarding technical records, SW, ATM, LR, $_{8\text{-}115}$ADG and $_{8\text{-}115}$FCI changed by +1 kg, −8 days, −0.5%, +40 g/day and −0.15, respectively. Annualized per 100 sows, revenue increased by €4630 and feed costs decreased by €8500. Margin per pig rose by €3.7, including vaccine cost (€1.4).

Discussion and Conclusion

Under the conditions of this field study, improvements in batch homogeneity and digestive health were notable, although it is difficult to attribute these changes with certainty to improved control of L.i. Technical performance gains improved profitability, with an estimated return on investment of 2.7. The results support the consideration of vaccination in herds suspected of L.i. subclinical infection.

HHM-PP-15

SOW DEATH RISK FACTOR ANALYSIS BASED ON PRODUCTION DATA OF 16 SPANISH FARMS.

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Background and Objectives

Sow mortality has risen in recent years, creating major challenges for animal welfare, farm productivity, and economic sustainability. Previous studies highlight influences such as parity, season, and farrowing-related complications, yet limited evidence exists for mortality patterns across reproductive stages in Spanish sow herds. This study aimed to characterize stage-specific mortality and identify key risk factors at herd and sow levels.

Material and Methods

Between January 2019 and December 2024, 488,849 service records were obtained from 106,351 sows across 16 Spanish farms with consistent death classification criteria. Gilts removed before first service were excluded. Incidence rates were estimated using two-level Poisson regression models (GLIMMIX) with an offset, across two reproductive periods. Herd-level and sow-level risk factors were evaluated. Three matched case–control studies compared reproductive and lifetime performance between deceased sows and matched controls.

Results

Among all deaths, 55.6% occurred before farrowing and 44.4% after. Mortality peaked during late gestation (days 105–118) and during the first and fourth weeks post-farrowing. Internal gilt replacement was associated with higher post-farrowing mortality. Before farrowing, parity ε3 and single-service sows showed higher mortality. After farrowing, elevated mortality was observed in parity 1 sows and repeat breeders. Seasonal effects were pronounced, with the highest mortality in sows bred in spring and farrowing in summer. Case–control analyses showed that deceased sows had shorter gestation lengths, fewer piglets born and born alive, more stillborn fetuses in their last litter, younger age at first service, fewer parities at removal, and fewer lifetime weaned piglets.

Discussion and Conclusion

Late gestation and early postpartum represent the most critical windows for sow survival. Internal gilt replacement, repeat breeding, and vulnerability of parity 1 sows emerged as important risk factors. Seasonal patterns indicate a need for environmental mitigation during summer farrowing. Performance patterns of deceased sows support incorporating early reproductive signals into long-term management and culling decisions.

HHM-PP-16

HOT OR COLD? THE EFFECT OF TEMPERATURE ON SOW MORTALITY.

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Background and Objectives

Heat stress has become an increasingly important welfare and productivity challenge in swine production. In recent years, Europe has experienced record-breaking summer heat waves, raising concerns about climate-related impacts on sow survival. Sixteen Spanish farms reported noticeable summer peaks in sow mortality, with a marked upward trend after 2022. This study aims to estimate the fraction of deaths attributable to non-optimal temperatures on sow mortality.

Material and Methods

We reconstructed local weather exposures for the period 2019–2024 using daily municipality-level temperature and humidity fields to derive daily mean temperature and relative humidity. Entry and removal records of sows were used to estimate the daily population at risk and the number of deaths. Temperature–mortality associations were assessed using a distributed lag nonlinear model fitted within a conditional quasi-Poisson regression framework, adjusting for humidity with natural splines. Attributable fractions and numbers of deaths were then estimated.

Results

Across 34008 farm–day observations, daily deaths averaged 0.73 (±1.65; range 0–106). Mean daily temperature was 15.35ºC (±7.58; range −8.15 to 34.49ºC), and relative humidity was 62.12% (±15.57; range 10.5–97.9%). The minimum mortality temperature (MMT) was 15.7ºC. Cumulative RR increased up to about 1.2–1.3 at the lowest temperatures and rose sharply at high temperatures, exceeding 2.0 above 30ºC. Lag–response analyses indicated that most temperature effects occurred on the day of exposure. Overall, 14.7% of deaths were attributable to exposure to non-optimal temperatures (H3,658 deaths), with heat accounting for 9.9% and cold for 4.8%.

Discussion and Conclusion

Our results show that departures from the MMT markedly increase sow mortality, with heat exerting a stronger and more immediate impact than cold. Most temperature effects occurred within the first few days, indicating high acute vulnerability during heat exposure. These findings highlight the growing climatic risks for sow survival and underscore the need for enhanced heat-mitigation strategies.

HHM-PP-17

CASE STUDY: ACCUMULATION OF PRRSV-1 IN MIXED GROUPS OF PIGLETS AT THE END OF NURSERY

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Background and Objectives

PRRSV-1 is endemic in the Netherlands, with >90% of sow herds vaccinated and 40% of nurseries PCR positive. At 8–10 weeks, piglets are selected for finishing barns; underweight piglets are moved to younger batches, creating mixed-age rooms. This study aimed to assess PRRSV dynamics in 'mixed' versus 'intact' groups at the end of nursery.

Material and Methods

Two farrow-to-feeder herds in the Netherlands (H1100 sows) were sampled every 4 weeks at the end of the nursery period for 15 and 4 periods. 'Intact' rooms housed one age group; 'mix' rooms included underweight piglets from older batches. Per room, in 3 non-adjacent pens oral fluids were collected, pooled and tested by PRRS PCR (VLG, Epe). Data was analyzed in Excel; Chi-square (2×2) and Mann-Whitney U tests were applied.

Results

PRRS PCR positivity occurred in 10/19 samplings for intact groups and 15/19 for mixed groups ($X^2(1, N=38)=2.9231$, $p=0.0873$). Mean Ct-values: intact 35.81 vs. mix 33.33 ($p<0.00001$).

Discussion and Conclusion

Avoiding PRRSV accumulation in groups is critical to prevent horizontal transmission and recirculation within herds. Mixed rooms showed a trend toward higher PRRSV PCR positivity and significantly lower Ct-values, indicating greater viral load. Mixing piglets of different ages at nursery end increases PRRSV accumulation, posing a risk for farm-wide recirculation. Both farms adapted protocols based on these findings.

HHM-PP-18

SUPPLEMENTATION OF LAURIC ACID GLYCERIDES IN SOWS' DIET IMPROVES OFFSPRINGS' PERFORMANCES, HOMOGENEITY AND PASSIVE IMMUNITY

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Background and Objectives

Glycerides of lauric acid (GLA) supplementation in monogastric diets has shown promising immunomodulatory properties, notably enhancing immune response and resilience to bacterial and viral pathogens. This study investigates the effect of GLA supplementation in sow diets on maternal immune transfer, piglet performance and resilience during lactation and post-weaning.

Material and Methods

Forty-five gestating sows were randomly assigned to 2 groups; control group (n = 24) and GLA-supplemented group (FRA® C12 Dry at 2 kg/T, n = 21), with similar body weight (BW), parities, body condition scores and serum IgG levels. The trial lasted five weeks, two weeks pre-farrowing and three weeks of lactation. Sows' (BW, feed intake, back fat thickness) and piglets' performances (BW and survival at birth and weaning were recorded). Total immunoglobulin concentrations (IgG, IgA, and IgM) in colostrum and milk were quantified by ELISA, and serum IgG levels of piglets were measured using the same method.

Results

Sows' zootechnical performance did not significantly change between the groups. However, GLA supplementation increased the proportion of live-born piglets (89.2 vs. 83.1%, $P < 0.02$) and reduced stillbirths (9.4 vs. 15.1%, $P = 0.02$). Piglets from supplemented sows exhibited higher BW (+6.2%, $P = 0.02$), total weight gain (+8.6%, $P = 0.01$), and daily gain (+10.1%, $P = 0.007$). Litter homogeneity improved significantly (CV = 0.35 vs. 0.44, $P < 0.05$). Immunoglobulin analysis showed a 12% numerical increase in colostrum IgG and a 86% significant increase in piglet serum IgG at five weeks of age ($P < 0.05$), indicating enhanced maternal immune transfer.

Discussion and Conclusion

GLA-supplementation during late gestation and lactation improved piglets' viability, growth performance, and liter uniformity, likely through enhanced colostrum and milk quality immune transfer. These findings support GLA as a nutritional strategy to promote sows' productivity and piglets' health and resilience during lactation and early post-weaning.

HHM-PP-19

PLANS VERSUS PRACTICE: LESSONS FROM PRRS OUTBREAKS

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Background and Objectives

Porcine reproductive and respiratory syndrome (PRRS) is a clinically and economically significant viral disease of swine. A primary defense against PRRS is on-farm biosecurity protocols. Despite this, outbreaks remain a costly challenge each year. The objective of this study was to identify potential risks and identify gaps in biosecurity implementation shortly after reported PRRS outbreaks in the Midwest US.

Material and Methods

A cross-sectional survey of swine farms was conducted during in-person visits to investigate PRRS outbreaks identified across four different swine companies throughout 2025 in Ohio, US. Site visits were typically one hour in duration and interviews were utilized to complete structured questionnaires capturing information on topics including demographics, vaccination status, biosecurity, feed and water management, animal movement and disposal management. All data were descriptively analyzed.

Results

Five farms were visited: four from March to April and one in October. Two farms were farrow to wean, two were finishers, and one was a nursery, with an average herd size of 2,740 pigs (1,600-5,200). Systems were either continuous flow (40%) or all-in-all-out by building (60%). Four -sites reported a neighboring farm of the same system within 5 miles (range: 1-5 miles) and the nearest site of a different system within 15 miles (range: 0.5-14.4 miles). Notably, though no sites were multi-species, some sites were within 15 miles and as few as 1,000 feet of multi-species slaughter or market facilities. All sites reported the use of farm-specific boots and coveralls for staff and visitors and 60% reported shower-in or Danish entry. All farms indicated the use of a visitor logbook.

Discussion and Conclusion

Farms reported biosecurity plans in place, but in-person visits revealed discrepancies in day-to-day implementation, creating important disease introduction risk. Existence of neighboring multi-species facilities may also play a role. Additional PRRS outbreak investigations should be conducted, and the potential inclusion of PRRS negative farms would allow for comparisons to clarify additional risks.

HHM-PP-20

ESTABLISHMENT OF ON-FARM REINFORCED BIOSECURITY MEASURES TO REDUCE THE RISK OF DIRECT AND INDIRECT WILD BOAR CONTACT IN SWEDISH PIG HERDS

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Background and Objectives

Since 2016, Swedish animal health organisations have run a national biosecurity program "SSB gris" in collaboration with the Swedish pig producers' organisation. In 2021, a new set of requirements for pig production in areas with ASF was introduced in Regulation (EU) 2021/605. To address this, the Swedish Board of Agriculture granted the organisations funding to develop control measures corresponding to the requirements in the Regulation to be included in the "SSB gris" program.

Material and Methods

In 2020, the program organisations formed a working group together with the Swedish Board of Agriculture and the Swedish Veterinary Agency. The aim was to develop a module based on the biosecurity requirements in Annex II of (EU) 2021/605, to provide information to both veterinarians and farmers and to raise their awareness of biosecurity.

Results

The new ASF-module was included in the program in October 2023. Late 2025, 49 herds were enrolled in the module. The ASF-module provides questionnaires for both farmers and specially trained veterinarians to identify weak points and raise awareness for biosecurity in all areas of the farm. The requirements in the ASF-module include e.g. fencing, clear separation of clean and dirty zones, animal transportation, cleaning and disinfection, employee training and carcass storage.

Discussion and Conclusion

Significant investments and labour is needed to meet the requirements in the ASF-module. In most farms, work to improve biosecurity is ongoing, but considerable improvements still need to be made on several farms. Increasing on-farm biosecurity significantly decreases the risk of introducing ASF into domestic pigs in the event of another introduction among Swedish wild boars. The efforts further reduce the number of non-compliant farms at risk of transport bans, causing animal suffering due to overcrowding. With every farm reaching compliance with the ASF-module, the food supply is further secured and the costs for the state during a potential outbreak are decreased.

HHM-PP-21

RISK FACTORS FOR SOW MORTALITY: INSIGHTS FROM 1.5 MILLION PRODUCTION CYCLES

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Background and Objectives

SEGES InSight is a database retrieving information from the management software (Agrovision, Cloudfarms, SKIOLD) of more than 250 Danish sow herds (>280,000 sows). It contains detailed records of events for each sow, including information on mating, farrowing, weaning, and whether the sow was sent for slaughter, died suddenly or was euthanized. This study uses SEGES InSight and other data sources to identify and prioritize risk factors for sow mortality, including sudden death and euthanasia.

Material and Methods

SEGES InSight data were combined with information on diseases (SPF-SUS, VetReg), daily outdoor temperatures for each herd (Danish Meteorological Institute), and additional data on feeding types and systems. Data from the SEGES InSight dataset were analyzed, comprising 236 commercial herds and 1,517,890 production cycles. Inclusion criteria were sows born after January 1, 2021; mated at least once. Animals were followed until death or until December 31, 2024. Statistical analyses included univariate and multivariate models, with outcomes categorized as sudden death or euthanasia.

Results

Preliminary results showed that the fewer total piglets born, the higher the risk of both sudden deaths and euthanasia of sows. A low total-born count in the previous litter specifically raised the likelihood of sudden deaths in the next parity. Age at first mating was found to influence the risk of both sudden deaths and euthanasia and findings support the recommended mating age of 210–230 days. The risk of sudden deaths was found to increase along with outdoor temperatures. Feeding systems and feed types used in gestation units had varying impacts on sow mortality.

Discussion and Conclusion

Sow mortality can be reduced by paying extra attention to sows with few total-born piglets at the next farrowing or by culling them. Outdoor temperatures above 20°C increase the risk of sudden death, requiring preventive measures. A mating age of 210–230 days can decrease sow mortality.

HHM-PP-22

SYSTEMATIC BACTERIAL INVESTIGATION OF ON-FARM PIGLET VACCINATION EQUIPMENT

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Background and Objectives

Various prophylactic procedures, including vaccinations and iron applications, are administered to young piglets via intramuscular or subcutaneous injections. These procedures are often performed by rotating farm staff using multi-use equipment. Repeated use of syringes and needles creates a risk of cross-contamination and pathogen transmission between animals. To mitigate this risk, veterinary best practices recommend systematic needle replacement, such as between individual litters. This study describes hygienic conditions of on-farm vaccination equipment through bacteriological analysis.

Material and Methods

During single herd inspections at 10 piglet-producing farms, vaccination equipment was systematically sampled and bacteriologically examined. Samples included: flush solutions from syringes prior to vaccination, needles after 25 and 50 injections respectively, and post-vaccination samples collected in sterile NaCl (n=46). Residual fluids of varying quantities were collected from syringes when available (n=7). Aerobic and anaerobic bacterial contamination was quantified using serial dilutions and cultivation on Columbia blood agar plates. C.perfringens was assessed qualitatively under anaerobic conditions (n=38). Suspected swine pathogens were identified phenotypically using classical bacteriological methods and MALDI-TOF chromatography.

Results

Overall, 98.8% (45/46) of samples with known initial volumes showed positive bacterial counts, averaging 8.95E+06CFU/ml (range:<10 to 1.40E+08, SD2.36E+07). Category I results (δ10CFU/ml) were obtained in 6.5% (3/46), Category II (>10-1000CFU/ml) in 10.9% (5/46), and Category III (>1000CFU/ml) in 82.6% (38/46) of samples. Clostridium spp. were found in 89.5% (34/38), primary pathogens (S.suis, S.hyicus, S.aureus, hemolytic E.coli) in 15.2% (7/46), and Pseudomonas sp. in 32.6% (15/46) of samples. Residual fluids (n=7) yielded CFU/ml ranging from <10 to 7.80E+07.

Discussion and Conclusion

According to European Pharmacopoeia, Water for Injections should contain <10CFU/100ml. Findings reveal extensive bacterial contamination of on-farm vaccination equipment, emphasizing the need for systematic cleaning and regular needle replacement. The detected pathogens may pose significant health risks, particularly to young or immunocompromised animals.

HHM-PP-23

MONITORING PRRSV: THREE YEARS OF PCR SURVEILLANCE IN NEONATAL PIGLETS IN THE NETHERLANDS

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Background and Objectives

Effective control of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in swine production depends on piglets being born free of infection. Monitoring neonatal piglets provides an early and practical indicator of sow herd status. The Dutch National PRRS Plan, introduced in 2021, aims to enhance PRRSV control across the industry. This study evaluates the broader impact of the plan on PRRSV prevalence in Dutch neonatal piglets over a three-year period.

Material and Methods

Between July 2022 and October 2025, samples were collected from neonatal piglets in randomly selected sow herds representative of the Netherlands. Each quarter, an average of 31 farms submitted 271 pooled samples. Sample types included processing fluids (testicles from castration at day 2–5), tongue tissue fluids from stillborn or day-one dead piglets, and umbilical cord fluids from neonatal piglets. Farm staff collected samples under veterinary guidance. One sample represented up to 60 litters; multiple samples from a farm within a week were processed as one batch. PCR testing was performed in one of three Dutch commercial laboratories; qualitative results were considered comparable. A batch or farm was classified positive if at least one sample had a Ct value <40.

Results

PRRSV was detected in approximately 55% of farms per quarter throughout the study. Farm positivity rates were higher in the first half of each year. Over time, the proportion of positive farms remained stable, but fewer batches tested positive per farm, suggesting progress in reducing within-herd infection pressure.

Discussion and Conclusion

Pooled PCR testing in neonatal piglets is a practical, cost-effective tool for sow herd monitoring. Neonatal PRRS PCR positive results are very likely wild type virus. Despite potential influences from field conditions and sample handling, findings confirm PRRSV remains endemic in the Netherlands. However, gradual improvement in herd status suggests the Dutch National PRRS Plan has positively impacted awareness and interventions.

HHM-PP-24

COULD AN ATP REFRACTOMETER BE USED AS A PROXY FOR WATER HYGIENE EVALUATION: RESULTS OF A PILOT STUDY

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Background and Objectives

Water is known as the "forgotten nutrient" and only recently has water hygiene become part of general hygiene management on pig farms. Water quality is checked annually for quality assurance using microbiology tests. ATP refractometers have been used in other areas as a proxy for surface hygiene but to date, to the authors' knowledge, no published data is available with regards using ATP refractometry to check livestock water hygiene.

Material and Methods

Samples were taken from twenty farms at the end of the finishing period and after routine water system cleaning and disinfection (C&D). They were taken at the water source and the first, middle and last drinkers. Samples were tested with traditional microbiology (TVC cfu/ml at 22° and 37°C, Coliform cfu/100ml and E. coli cfu/100ml) by an external laboratory and were analysed on farm, using the Hygiena EnSURE Touch ATP monitor and Aquasnap Total swabs. Analysis was performed using JMP18.

Results

A regression model was fitted for pre and post C&D samples for ATP refractometer values and traditional microbiology analysis. Pre-disinfection ATP values were significantly correlated with TVC cfu/ml at 37°C, Coliform cfu/100ml and E. coli cfu/100 ml ($p\delta 0.05$), but not the TVC cfu/ml at 22° ($p=0.06$). Because of limited sample size and effective disinfection yielding a lot of zero values for all variables, no regression model could be fitted post C&D.

Discussion and Conclusion

Results demonstrate that ATP refractometry has a good correlation and regression model with microbiology but has the benefit of being fast and cheaper. They also demonstrated the benefits of water system C&D on bacterial load of free-flowing water. However, care some needs to be taken because ATP values do not identify the specific pathogens present but have good correlation with coliforms incl. E coli.

HHM-PP-25

IMPACT OF PHAGE THERAPY IN POST-WEANING PIGLETS CHALLENGED WITH ETEC STRAIN IN A CONTROLLED MINITRIAL

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Background and Objectives

Enterotoxigenic Escherichia coli (ETEC) is a pathogen responsible for post-weaning diarrhea (PWD) in piglets, resulting in economic losses in pig production. The rise of antibiotic-resistant ETEC strains with restrictions on zinc oxide, pig feed requires alternative management approaches. Our study examines bacteriophage therapy as a solution to control ETEC infections in newly weaned piglets.

Material and Methods

A cocktail of phages targeting ETEC F4LT1ST2 strain was prepared. We conducted a trial including nine piglets divided into three groups: A negative control group exposed to the phage cocktail by administration on the bedding material, a treatment group exposed to the ETEC strain and to the phage cocktail, and a positive control group exposed to the ETEC strain only. Daily diarrhea, temperatures, and phage and bacterial counts in fecal samples were monitored throughout 10 days to evaluate phage therapy effect on gut microbiota dynamics and piglet health. Shotgun metagenomic sequencing was performed on fecal samples to characterize bacterial and phage dynamics.

Results

The treatment group showed a lower incidence of diarrhea compared to the positive control ($p>0.05$). Alpha diversity did not differ between treatment groups across timepoints, suggesting that phage administration did not cause major shifts in microbial diversity. Metagenomic analyses showed that E. coli abundance remained highest in the ETEC group, while the ETEC+phage group maintained lower levels, though they were not statistically significant. Consistent with these observations, plaque assay results confirmed active phage–bacteria interactions: no plaque formation was detected in the feces of the ETEC-only group, whereas the ETEC+phage group showed phage replication, reaching 100,000 PFU/ml.

Discussion and Conclusion

Our study highlights the potential of phage therapy as an alternative to antibiotics for ETEC infections in piglets. Additional research with larger sizes and longer durations is required to confirm these findings and develop optimal phage application methods for swine production.

HHM-PP-27

CORRELATION BETWEEN EXTERNAL AND INTERNAL CLAW LESIONS IN SOWS

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Background and Objectives

Claw and leg problems are among the most common reasons for sow euthanasia. Previous studies report that 80-99 % of sows exhibit at least one claw damage, predominantly affecting the outer claws, with hind legs being most vulnerable. This study focused on hind legs to investigate the correlation between external and internal claw lesions in euthanized or spontaneously dead sows.

Material and Methods

A total of 513 hind legs were collected from 306 herds at the main rendering plant in Denmark. Of these, 258 legs were from euthanized sows and 255 from sows that died spontaneously. Pathological examinations were carried out at the Veterinary Laboratory Kjellerup, Denmark. External were recorded and analyzed to assess statistical correlations.

Results

Euthanized sows had significantly more external and internal claw lesions compared to sows that died spontaneously (p=0.017). There were significantly more lesions in the outer claw than in the inner claw. Several external claw lesions were significantly correlated; for example, sows with uneven sized claws also had overgrown claws (r=0.56) and heel horn growth (r=0.24). Internal lesions such as arthritis and bone marrow inflammation showed strong intercorrelations (r up to 0.76). When wounds were observed on the sow's skin near the dewclaw, coronary band or pastern, or when the claw wall was detached, inflammation was often present in the underlying tissue, joints and bones.

Discussion and Conclusion

Results show a clear correlation between external claw lesions and internal claw lesions in sows. The wall and sole of the claw provide protection, but damages to the dewclaw, pastern and coronary bands seem to increase the risk of internal infections. Future studies should focus on preventing and treating skin injuries and claw lesions, as well as managing overgrown claws and dewclaws through trimming.

HHM-PP-28

EFFICACY OF A DUAL-STRAIN BACILLUS PROBIOTIC IN SOW DIETS: FIELD EVALUATION ACROSS SIX COMMERCIAL FARMS

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Background and Objectives

Evaluating feed additives under controlled conditions often limits assessment of mortality and antibiotic use due to low baseline incidence and artificial environments. This study investigated the efficacy of a dual-strain Bacillus-based probiotic under commercial conditions across six Spanish farms sharing ownership, feed mill, and standardized management, ensuring practical relevance while minimizing variability.

Material and Methods

A total of 4,350 sows were monitored in two periods: BEFORE (standard diets) and DURING (standard diets supplemented with SolPreme®: Bacillus subtilis–541 and Bacillus amyloliquefaciens–516 at 1.1×10^9 CFU/kg). Five batches of sows per period were followed through one cycle. BEFORE batches were inseminated Nov23–Feb24; DURING batches May24–Jul24. No management changes occurred during the study. Data collected included reproductive performance, mortality, and antibiotic use. Statistical models accounted for period, farm, batch, and parity. During both periods, 15 fecal swabs from sows on day 21 of lactation (one farm) were analyzed via Oxford Nanopore sequencing of the 16S rRNA gene (V1–V8 regions) using QIIME2 and R.

Results

Pre-weaning mortality was numerically lower in the DURING period (-6.3%; P=0.42), with a significant reduction in meningitis-related deaths (P=0.04). Reproductive performance was unaffected, though sows tended to wean more piglets (+0.25; P=0.085). Piglet medication use decreased markedly, especially for diarrhea and lameness (P<0.001), while sow medication remained low. Microbiome composition differed significantly between periods (P=0.001), with depletion of Escherichia coli and Shigella dysenteriae and enrichment of three Lactobacillus species (P<0.05) in the DURING period.

Discussion and Conclusion

Testing under commercial conditions allowed evaluation of the Bacillus-based probiotic in a realistic setting. Improvements were observed in piglet health, including fewer meningitis-related deaths and lower medication use, particularly for diarrhea and lameness, alongside a tendency for more piglets weaned. These findings suggest that SolPreme® can enhance sow herd productivity and reduce antibiotic interventions in practical production systems.

HHM-PP-29

COCCIDIOSIS CONTROL IN FARROWING HOUSE: POLYHERBAL MIXTURE FOR SOWS WITH OR WITHOUT CONVENTIONAL ANTICOCCIDIAL TREATMENT IN PIGLETS

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Background and Objectives

This study evaluated the supplementation of sows with a polyherbal mixture (NuxaSan™, containing 15% saponins and 1.0–1.5% tannins) combined with a conventional anticoccidial program for piglets to improve coccidiosis control and zootechnical performance in the farrowing house.

Material and Methods

Forty-eight DanBred sows (parity 1-6; with 16.7% young females (parity 1), 4 in each treatment), were assigned to: Control (C1, n=24), without supplementation; and Polyherbal Mixture (PHM, n=24), from 90 days of gestation (500 g/ton) + lactation (300 g/ton; 23 days). Litters were divided into a 2×2 factorial design: Control (C2, no anticoccidial, n=12), and Anticoccidial (A, toltrazuril 5% at 3 days, n=12). Faecal samples from piglets (at 1, 5, 10, and 20 days) were analysed for C. suis oocyst counts using the Kruskal-Wallis test, while performance was analysed by factorial ANOVA + Tukey's test (Minitab® 19).

Results

PHM supplementation, alone or combined with toltrazuril, reduced oocyst-positive piglets at d5 (PHM 30% vs C1 80%, $P<0.05$; C1+C2 100%^{a}, PHM+C2 20%^{b}, C1+A 60%^{ab}, PHM+A 40%^{ab}, $P<0.05$), d10 (PHM 10% vs C1 60%, $P<0.05$; C1+C2 80%^{a}, PHM+C2 20%^{b}, C1+A 40%^{ab}, PHM+A 0%^{b}, $P<0.05$) and d20 (PHM 0% vs C1 20%; $P<0.10$). Litters from PHM showed lower mortality before d10 (PHM 1.2% vs C1 3.3%; $P<0.10$) and reduced body weight variation at weaning (PHM 14.9% vs C1 18.4%; $P<0.05$), with positive synergy between both strategies for this last parameter (C1+C2 17.1%^{ab}, PHM+C2 17.6%^{ab}, C1+A 19.6%^{a}, PHM+A 12.2%^{b}, $P<0.05$).

Discussion and Conclusion

In this farrowing house, NuxaSan™ supplementation reduced coccidial pressure, leading to lower piglet infection rates, mortality, and weaning heterogeneity. The combined use of PHM with toltrazuril showed synergistic effects, enhancing coccidiosis control and litter homogeneity.

HHM-PP-30

POLYHERBAL MIXTURE FOR SOWS WITH OR WITHOUT CONVENTIONAL ANTICOCCIDIAL TREATMENT IN PIGLETS: CARRY-OVER EFFECTS ON THE NURSERY PHASE

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Background and Objectives

Cystoisospora suis remains a major cause of neonatal coccidiosis in piglets, leading to diarrhoea, reduced growth, and poor uniformity at weaning. This condition has a direct and negative impact on the post-weaning productive performance. This study aimed to evaluate the zootechnical performance of nursery piglets from sows supplemented with a polyherbal mixture (NuxaSan™, containing 15% saponins and 1.0–1.5% tannins) in combination with a conventional anticoccidial treatment for piglets in the farrowing house.

Material and Methods

Forty-eight sows were divided into two treatments: Control (C1, n=24), without supplementation; and Polyherbal Mixture (PHM, n=24), from 90 days of gestation (500g/ton) + lactation (300g/ton; 23 days). Litters were further divided into a 2×2 factorial design: Control (C2, no anticoccidial, n=12), and Anticoccidial (A, toltrazuril 5% at 3d, n=12). A total of 144 weaned piglets were followed up in the nursery phase (23-65d). Piglets were weighed individually, and feed intake was recorded at 0, 14, 28, and 42 days of nursery. Data were analysed by factorial ANOVA + Tukey's test (Minitab® 19).

Results

Piglets from sows supplemented with PHM and that received toltrazuril 5% in the farrowing house presented the lowest feed conversion ratio (FCR) for the first 14 days of nursery (C1+C2 1.433^{b}, PHM+C2 1.611^{a}, C1+A 1.405^{b}, PHM+A 1.222^{c}, P<0.05), and lower FCR for the final phase (28–42 days) (C1+C2 1.453^{ab}, PHM+C2 1.489^{a}, C1+A 1.479^{a}, PHM+A 1.382^{b}, P<0.05) and total period (C1+C2 1.403^{b}, PHM+C2 1.472^{a}, C1+A 1.412^{b}, PHM+A 1.372^{b}, P<0.05).

Discussion and Conclusion

Maternal supplementation with NuxaSan™ showed strong synergy with the use of toltrazuril for piglets, with benefits that extend beyond the lactation phase, yielding the best feed conversion and overall nursery performance. This combined strategy appears most effective for optimizing post-weaning growth under C. suis challenge conditions.

HHM-PP-31

OPTIMIZING PCV2 VACCINATION TIMING IN SOW HERDS: IMPLICATIONS FOR PIGLET GROWTH AND HEALTH

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Background and Objectives

Porcine circovirus type 2 (PCV2) is a globally prevalent virus that negatively affects swine health and growth. Piglet vaccination around weaning is a common practice and it has proven effective in reducing viral load and improving productivity. Recent studies suggest additional benefits when sows are vaccinated. This study aimed to evaluate piglet performance based on different intervals between sow vaccination and farrowing, to identify an optimal vaccination protocol.

Material and Methods

A multi-site Hungarian farm with 1,600 sows was selected. The farm transitioned from biannual mass vaccination with Ingelvac CircoFLEX® to per-cycle sow vaccination at weaning. PCV2 circulation had previously been confirmed via PCR in fetal tongue tips and piglet serum. Production batches were grouped by the : long (24–27 weeks), medium (12–21 weeks), and short (3–9 weeks) interval. Key performance indicators were statistically analyzed during the nursery phase.

Results

A total of 86 batches were evaluated. In the nursery phase, piglets from the medium interval group showed a trend toward lower nursery mortality (2.2%95%CI1.78-2.65) compared to the long (2.48%95%CI1.83-3.1) and short (2.8%95%CI2.21-3.4) groups . Average daily weight gain (ADWG) was numerically different in the medium-interval group (400 g/day), compared to the short (374 g/day) and long (394 g/day) intervals. In the fattener phase there were no statistically significant differences found among groups in respects to mortality and ADWG.

Discussion and Conclusion

Maintaining high immunity in sows during gestation is crucial to minimizing vertical transmission of PCV2 to piglets. While piglet vaccination is standard, sow vaccination adds protection by reducing in utero exposure. Shorter intervals may not allow full immune response, while longer intervals risk waning immunity before farrowing. The medium interval group showed trends toward improved nursery performance, suggesting this timing may optimize in-utero protection and maternal antibody transfer.

HHM-PP-32

ESTIMATED ECONOMIC LOSS DUE TO MYCOPLASMA-LIKE LUNG LESIONS

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Background and Objectives

Post-mortem lung scoring is a well-known tool to assess the farm respiratory health status. Historically, strong correlation between Mycoplasma-like lung lesions and daily gain and/or feed efficiency has been reported (Ferraz 2020, Morris 1995, Paisley 1993, Straw 1989). The Ceva Lung Program (CLP) was confirmed as a valuable tool for establising the prevalence and severity of Mycoplasma-like lung lesion at slaughter. CLP is used worldwide, and annually more than a million lungs are scored. The aim of this study is to estimate the impact of lung lesions on herd productivity.

Material and Methods

In the 2024 Danish "Lungvember" campaign promoting optimum respiratory health was completed for the third time. Following slaughter, lungs were submitted to the Veterinary Laboratory, Kjellerup, for scoring using the CLP method. Mycoplasma-like lesions were scored as volume percent (MLL%). The economic loss was estimated based on Danish model farm 2025.

Results

In 2024, 72 finisher herds participated in Lungvember campaign, of these 61 had mycoplasma-like lesions. MLL% averaged 3.13 for the affected herds was correlated to reduced production value. The loss per one MLL% was estimated to 0.26 €/pig, based on the Danish model farm. The average loss in these 61 Danish herds amounted to 0.81 €/pig with a 95 percent confidence interval from 0.46 € – 1.24 €/pig. This covers for a loss of 13 grams/day, and an increase of 0.02 kg feed/kg gain.

Discussion and Conclusion

Post-mortem lung scoring is a valuable tool for assesment of respiratory health status that can be easily used to determine economic losses. The available data for losses in feed efficiency are quite old, but correlations found seem not unrealistic. Losses of daily gain due to Mycoplasma-like lesions are better documented. All this stresses the importance of reducing pneumonia in finishing pigs, improving management, all-in all-out batch production and optimizing vaccination, to reduce economic losses, antibiotic use and improve welfare.

HHM-PP-33

IMPLEMENTATION OF BIOSECURITY MEASURES ON PRRS ON A SELECTION OF FARMS IN THE NETHERLANDS

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Background and Objectives

PRRS is a complex disease. Several tools have been developed to assess biosecurity measures. In this overview results of COMBAT biosecurity tool are described.

Material and Methods

In the period 2022 – 2025 the audit was conducted in 43 sow herds. Seventeen of the sow herds were part of farrow-to-finish farms, twenty-three had no finishing pigs. The audits were performed by on site interviews by one of two field vets from Boehringer Ingelheim.

Results

On 31/ 43 (72%) farms, the closest neighboring pig farm was less than 500 meters. PRRS status of these neighboring pig farms was unknown on (81%). 21 of the 43 farms sourced gilts externally, only 10 farms (23%) tested gilts before adding them to the herd. Quarantine period lasted 1–4 weeks on 9% of farms, 5–8 weeks on 18%, 12+ weeks on 29%, 27% used no quarantine. Vaccination with MLV PRRSv was in place on 88% of the farms. 40% used a mass vaccination. 23% of the farms did not vaccinate piglets. Cross fostering within the same farrowing batch/ week group took place on 63% of farms. At weaning, 49% of farms moved piglets to a younger week group.

Discussion and Conclusion

A part of the farms in this study was also sampled for PRRSV PCR on neonatal piglets and at 10 weeks of age. These farms might be more aware about PRRSV-infections at their farms. Several key elements in preventing PRRSV circulation in sow herds in the Netherlands were not always accurate. To the authors it was surprising that when the general risks are high to very high (70%), this didn't result in a low to very low risk profile for external biosecurity and transport.

HHM-PP-34

LEARNINGS FROM DETECTING THE SOURCE OF PRRSV SOW HERD INSTABILITY BY COMPARING NEONATAL PRRSV PCR SAMPLES FROM FIRST PARITY VERSUS OLDER PARITY SOWS

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Background and Objectives

In PRRSV-unstable sow herds aiming to reduce neonatal piglet infection, identifying sources of (re)infection is critical. Monitoring neonatal samples for PRRSV may reveal poor gilt acclimation when first-parity (P1) litters show ε20% higher PCR positivity or ε20% lower Ct values than older parity (P2+) litters. This study evaluated this monitoring approach through systematic analysis of PCR results in neonatal piglets.

Material and Methods

A prospective cohort study was conducted in 41 Dutch farms (2023–2025) during PRRSV instability. Neonatal samples (processing fluids, tongue fluids, umbilical cords) were pooled by parity and tested by PCR in two commercial labs. Inclusion required ε12 samples per case and ε25% positivity. Data were analyzed by matched herd-week pairs (n=111) to compare P1 vs. P2+ for positivity rate and Ct values. Statistical power targeted an 18.7 percentage point difference in positivity and 1.81 Ct units (ؼ=0.05).

Results

Thirteen cases from nine farms met criteria. In 4/13 cases, P1 had ε20% higher positivity; in 1/13, average Ct was ε20% lower; and in 3/13, minimum Ct was ε20% lower. Conversely, P2+ had ε20% higher positivity in 9/13 cases, but never lower Ct values. For example, case A2 showed P1 at 100% vs. P2+ at 50% positivity, while case F showed P2+ at 67% vs. P1 at 22%. Overall, mixed logistic regression indicated P2+ litters had 1.54 times higher odds of positivity (p=0.18), with estimated probabilities of 37% (P1) vs. 48% (P2+). Ct differences were not significant (p=0.87).

Discussion and Conclusion

Parity-based PCR monitoring can highlight instability sources and guide vaccination and biosecurity discussions. While not scientifically validated, this approach proved useful for guiding field interventions. Continuous monitoring and strict sampling protocols are recommended to reduce cross-contamination and improve accuracy.

HHM-PP-35

HYGIENIC ASPECTS OF INTRAMUSCULAR INJECTIONS OF SOWS ON GERMAN FARMS

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Background and Objectives

Intramuscular injections are a standard procedure in sow farms with increasing frequency. In veterinary practice, the hygienic aspects of administration are often considered secondary to efficacy and side effects. Given the demand for antibiotic reductions, to minimize the transmission of pathogens and prevent potential subsequent infections, these aspects will become more important in future. This study was conducted to obtain data on hygienic parameters of intramuscular injection practices on sow farms.

Material and Methods

On 9 German sow farms (100-1500 sows, farm staffs 2-7) standardized bacteriological sampling of needles and syringes was performed. Residual needles from syringes, flush solution prior to vaccination, as well as needles used for 25 resp. 50 injections, were collected at two distinct time points on each farm (n=56). Quantification of aerobic and anaerobic bacterial contamination was performed using serial dilutions and cultivation on Columbia blood agar plates. Clostridium perfringens was assessed qualitatively (n=42). Suspected swine pathogens were identified phenotypically and by classical bacteriological differentiation methods. For further characterizations MALDI-TOF spectrometry was used.

Results

56 samples were collected (28 per time point) with 91.07% (51/56) with positive bacterial counts. Medium general CFU/ml was 1.58E+08 (min<10;max5.80E+09; SD8.05E+08), while CatI (<10CFU/ml) results were obtained in 10.71% (9/56), CatII (11-1000CFU/ml) in 33.93% (19/56) and CatIII (>1000CFU/ml) in 55.36% (31/56) of all samples. Similar results were obtained at both time points. Clostridium perfringens was detected in 95.24% of investigated samples (40/42), Pseudomonas spp. were found in 35.71% (20/56).

Discussion and Conclusion

This study highlights the importance of a systematic review of hygiene practices. The results indicate that these findings are unlikely to be incidental but instead point to a consistent and significant bacterial burden, involving various pathogens which may lead to both local and systemic inflammation caused by bacterial factors and an unintentional transmission of pathogens.

HHM-PP-36

THE INTERPRETATION OF CLASSICAL SERUM BIOCHEMISTRY FOR PORCINE HEALTH STATUS SCREENING BY STATISTICAL MODELLING.

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Background and Objectives

The classical serum biochemistry parameters play a pivotal role in assessing animal health and it can be of use for the diagnosis, prognosis, and treatment of livestock diseases. However, serum biochemistry interpretation can be tedious due to the large information supported. We have tried to change its applicability towards a health status screening tool using statistical models for the detection of sick animals.

Material and Methods

239 sick pigs suffering from diverse clinical signs of disease and 81 apparently healthy pigs from commercial growing farms in the southeast of Spain were used. Blood samples were collected during routine veterinary examination and the serum biochemistry parameters were quantified using a biochemical automatic analyzer Beckman Coulter AU480. The possible differences in all the biochemical parameters between healthy and sick animals were statistically analyzed considering the data distribution and homogeneity of variances to choose the correct test. Moreover, a binomial regression analysis was performed using jamovi software version 2.4 based on R packages to obtain those parameters that could discriminate between healthy and sick pigs.

Results

A total of 8 out of 13 parameters showed statistically significant differences between healthy and sick animals. When analyzing the biochemistry in the sick group of pigs, no renal and muscle damage was revealed, only possible hepatic alteration with elevated bilirubin, total protein, and glucose levels. However, regression analysis showed that the combination of 4 serum biochemical parameters (ALT, CK, Ca and total proteins) in a regression model could detect sick animals with a sensitivity of 80% and a specificity of 81%.

Discussion and Conclusion

The use of statistical modelling could simplify the interpretation of serum biochemistry when the objective is to evaluate the health status of pigs as an internal control tool. Using only four biochemical parameters sick animals could be detected with an 80% of precision.

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HHM-PP-37

USING TWO COMPLEMENTARY AUDIT TOOLS TO INVESTIGATE PREWEANING MORTALITY AND DIARRHOEA RISK FACTORS IN PIG FARMS

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Background and Objectives

Neonatal diarrhoea is a common condition with major impacts on piglet survival, growth and welfare. In addition to medical prophylaxis, effective prevention relies on controlling various risk factors associated with piglet survival and linked to animal and farrowing-house management. This study investigates the complementarity of two different audit tools for identifying areas of improvement and preventing pre-weaning mortality.

Material and Methods

The study was conducted on 20 pig farms with a history of chronic neonatal diarrhoea. During the farrowing week, each farm underwent the CEVA "High Quality Piglet" audit, which includes a questionnaire and a direct assessment of piglet comfort and colostrum intake. Compliance with recommendations was evaluated using a global index scored out of 100 (HQPI). Sow performance over the 12 months preceding the audit was analysed using the PERTMAT tool developed by IFIP. This analysis included pre-weaning mortality profiling and the automatic identification of mortality risk factors related to sows and litter management. Descriptive and univariate statistical analyses were performed to investigate relationships between HQPI, mortality rates and various risk factors.

Results

Litter size ranged from 15 to 17.1 liveborn (median 16.1) and mortality from 13.6 to 28.8% (median 17.2%). Prolificacy and mortality were higher than the national average in 70% of cases. HQPI varied between 53 and 87% (median 65%) and tended to correlate with mortality ($r=-0.323$, $p<0.20$), with four distinct HQPI-mortality herd groups identified. PERTMAT identified 4 to 12 mortality risks per farm (median 8), mainly related to large-litter management adjustments (>90% cases), sow parity, batch, farrowing day, gestation length, stillborn rate or season.

Discussion and Conclusion

This preliminary study confirmed the complementarity of the two audit tools. Objective quantitative analysis of data and practices highlighted the importance of a multifactorial approach and proper management of surplus piglets. This should help to prioritize measures to improve the health and survival of newborns.

HHM-PP-38

A CASE REPORT OF EFFICACY AND PROFITABILITY OF PIGLET VACCINATION TO CONTROL HIGHLY PATHOGENIC (HP) PRRSV1 INFECTION IN WEANERS

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Background and Objectives

The objective of this trial was to evaluate the efficacy and profitability of piglet PRRS vaccination, in combination with management measures, to control post-weaning mortality induced by a variant of a highly pathogenic PRRSV1 strain (Genbank accession number ON571708, commonly known as Rosalia).

Material and Methods

The study took place in a 270 sows closed herd, located in Catalonia (Spain). In 2024 the farm suffered a PRRSV outbreak of a variant of the highly pathogenic PRRSV strain Rosalia (97.52% homology with Genbank ON571708). In April 2025, although sows were stable, nursery mortality was still higher than expected. Once confirmed via PCR that piglet flux was negative at birth, it was decided to vaccinate piglets at 2w of age (Porcilis® PRRS via intradermal (ID) administration, MSD Animal Health) for 6 months. Also some management strategies were implemented, such as the 3w batch-system, AI-AO and a strict policy of sacrifices of non-recoverable animals.Efficacy of vaccination was determined by comparing mortality and clinical signs compatible with PRRS of pre- and post-vaccination batches. PRRSV presence was determined by PRRSV-PCR in blood samples from piglets at 6 and 9w of age. Data were statistically analyzed based on monthly mortality.

Results

The mortality of nursery was reduced by 87%, from an average of 8.66% in unvaccinated batches, to 2.2% in vaccinated batches ($p<0.001$). No clinical signs compatible with PRRS were observed in the vaccinated batches.No field virus was found in PRRSV-PCR results of blood samples of piglets at 6 and 9w of age.Vaccinated batches had an extra benefit of 2.62 €/piglet, including cost of vaccination.

Discussion and Conclusion

In this field experience, the combination of piglet vaccination and management measures was shown to be an effective and profitable strategy to reduce PRRS-induced mortality in weaners induced by a HP PRRSV1 strain.

HHM-PP-39

FROM OBSERVATION TO DECISION: A MULTI-STEP APPROACH TO HYGIENE ASSESSMENT IN LIVE PIGS' TRANSPORTS

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Background and Objectives

Inadequately cleaned transport vehicles can serve as reservoirs for pathogens, jeopardizing pigs' health status. Cleaning and disinfection (C&D) procedures represent a critical control point for limiting the risk of pathogen transmission. Regular C&D monitoring is essential: it increases personnel engagement and ensures trucks adequate hygiene.This study aimed to design and test a multi-step field monitoring protocol to objectively assess the hygiene status of live-pig trucks after C&D, and to identify an ATP threshold value predictive of microbial contamination.

Material and Methods

The monitoring protocol was developed combining complementary assessment methods, each providing an increasingly detailed level of evaluation. The first step consisted of a visual inspection (a 34-item, three-point checklist), followed by an ATP test only on surfaces achieving ε 80% on the maximum visual score. Environmental swabs were collected concurrently to determine the total mesophilic viable count (TVC). The protocol was applied to 15 trucks on farms prior to pig loading. A Receiver operating characteristic (ROC) analysis was performed to identify an acceptable ATP threshold indicative of adequate cleaning, inputting samples with TVC values $<10^4$ CFU/cm² as acceptable.

Results

The median (IQR) visual score was 93.9% (90.5–95.2%), ATP was 47.0 RLUs (27.79–71.63), and TVC was 100.0 CFU/cm² (88.0–1070.0). A trend toward a positive correlation (rho=0.29) was observed between ATP and TVC values (p=0.08). ROC analysis suggested an ATP threshold of approximately 80 RLUs to indicate acceptable hygiene levels.

Discussion and Conclusion

Although the visual checklist proved to be a practical screening tool, its inherent subjectivity led to the inclusion of ATP test to improve reliability. The positive correlation trend between ATP and TVC values supported the identification of an ATP threshold, although further investigations are needed to validate this finding. Nevertheless, it may offer an objective tool that could be implemented in the field as haulers' self-monitoring verification system.

HHM-PP-40

USE OF A RECTAL LINEAR PROBE FOR LUNG ULTRASONOGRAPHY IN PIGS – PRACTICAL IMPLICATIONS

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Background and Objectives

Lung ultrasonography is routinely used in cattle for the diagnosis of respiratory diseases, typically with a rectal linear probe that is widely available in field practice. In pigs, this method is rarely used, although it may be a valuable tool for early detection of subclinical lesions and herd health assessment. The aim of this study was to determine whether a standard rectal probe allows diagnostic imaging of porcine lungs at different ages.

Material and Methods

The study included 30 clinically healthy pigs from one farm, divided into three age groups: 5 weeks (n=10), 10 weeks (n=10), and 15 weeks (n=10). Examinations were performed using a 7 MHz rectal linear probe. As an acoustic coupling medium, 70% isopropyl alcohol was applied. Ultrasonography was performed transcutaneously on both sides of the thorax, with the probe moved from the axillary region towards the 10th–11th rib. The probe was positioned parallel to the spine, allowing simultaneous visualisation of several intercostal spaces, and scanning was directed ventrally. The right and left lungs were examined for pleural line visibility, lung sliding, ultrasound artefacts, and any pathological changes.

Results

In all age groups, a clear lung image was obtained with a visible pleural line and lung sliding, as well as typical A-line and single B-line artefacts. In some pigs, pleuritis-like changes were observed, including pleural thickening and irregularity, along with small consolidations appearing as hypoechoic areas up to 5 mm in diameter with C-line artefacts.

Discussion and Conclusion

Examination using a rectal probe is quick, non-invasive, and feasible on live animals. The probe is convenient to handle and allows lung assessment in the subscapular area, where early lesions are often located. The results indicate that ultrasonography may serve as a practical tool for respiratory disease diagnosis in pigs, enabling detection of both acute and chronic forms of pneumonia.

HHM-PP-41

EFFECTIVENESS COMPARISON OF 3 VACCINES AGAINST PCV2+M. HYOPNEUMONIAE ON BODY WEIGHT GAIN IN PIGS UNDER FIELD CONDITIONS

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Background and Objectives

Porcine circovirus type 2 (PCV2) is the causative pathogen of Porcine Circovirus Diseases (PCVD). Besides clinical symptoms, PCV2 significantly affects fattening performance parameters e.g. daily gains. PCV2d is currently predominant PCV2 genotype worldwide. The efficacy of commercial vaccines against PCV2 and M. hyopneumoniae varies as result of co-infections, different farm conditions and/or evaluation methods. The aim of the study was to compare new commercial vaccine containing PCV2d genotype+M. hyo for i.m. use CIRBLOC® M Hyo (Vaccine CMH) with 2 other vaccines containing PCV2a genotype+M. hyo for: 1) RTM i.m. administration (Vaccine A) and 2) intradermal administration (Vaccine B) on body weight performance in fatteners at the day of slaughter.

Material and Methods

All compared groups of piglets were vaccinated in the 4th week of life. Observations were conducted on the sow farms: “Farm C” (4900 sows) and “Farm J” (3700 sows), which have nursery units. Nearly 2900 animals were included in the trials until the end of fattening and slaughter. Individual groups of animals were marked with additional ear tags. Pigs were weighed in groups (Vaccine CMH, A or B). During fattening period, comparable groups were kept under the same conditions. Fatteners were weighed on the day of slaughter.

Results

Fatteners from farm “C” vaccinated with Cirbloc M Hyo® were heavier with a total gain of 3.1 and 3.2 kg (depending on the fattening unit) more than animals vaccinated with the intradermal product (Vaccine B). Fatteners from farm “J” vaccinated with CMH achieved 6.9 kg of total gain more than fatteners vaccinated with RTM product.

Discussion and Conclusion

The resulting differences in body weight, confirmed by slaughterhouses, represent additional revenue for the breeder. Under the same conditions, the only variable was the vaccination with CMH.

HHM-PP-42

UPDATED EVALUATION OF RESPIRATORY LESIONS ON CZECH PIG FARMS: LUNG SCORING INSIGHTS FOR 2025

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Background and Objectives

Routine lung scoring at slaughter remains an essential tool for assessing respiratory health and guiding preventive strategies on swine farms. Previous studies have demonstrated its value for estimating the economic impact of respiratory disease and evaluating vaccination outcomes. The Ceva Lung Program (CLP) provides a standardized approach for identifying EP-like and Actinobacillus pleuropneumoniae (A.p.)–like lesions. Building on earlier assessments, this study summarizes the prevalence and severity of respiratory lesions on Czech pig farms in 2025 and compares them with findings from 2024.

Material and Methods

The survey included conventional Czech pig farms without SPF status for Mycoplasma hyopneumoniae and A.p. Lung scoring followed the CLP methodology. In 2025, a total of 9,144 lungs from 116 audits were evaluated. Bronchopneumonia (BP) was recorded as an indicator of EP-like lesions, while dorso-caudal pleurisy (DP) was used to assess A.p.-like lesions. Median values for 2025 were compared with those from 2024.

Results

In 2025, 11.0% of lungs presented BP lesions, closely matching the 2024 level. The median percentage of affected lung surface across all lungs was 3.49%, indicating a low overall severity of pneumonic involvement. Dorso-caudal pleurisy affected 10.0% of lungs, and the APPI index reached 0.25, values comparable to those reported in 2024. These findings suggest stable levels of both EP-like and A.p.-like lesions across the evaluated herds.

Discussion and Conclusion

Respiratory lesions detected in 2025 show a consistent pattern with the previous year, reflecting sustained efficacy of preventive measures implemented on Czech pig farms. The stability of EP-like and A.p.-like lesion prevalence indicates that existing health management strategies continue to control major respiratory pathogens effectively. Ongoing slaughterhouse monitoring remains valuable for guiding future interventions and ensuring the continuous improvement of herd respiratory health.

HHM-PP-43

A PAN-EUROPEAN ASSESSMENT OF SLAUGHTERHOUSE LUNG LESIONS IN PIGS: 2025 SURVEY FINDINGS

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Background and Objectives

Lung lesion scoring at slaughter remains a practical and informative tool for evaluating respiratory health in commercial pig herds. Characteristic patterns associated with enzootic pneumonia and pleuropneumonia—particularly lesions linked to Mycoplasma hyopneumoniae and Actinobacillus pleuropneumoniae—enable structured monitoring of herd-level disease pressure. This survey aimed to consolidate updated lung-scoring data generated across major swine-producing regions of Europe during 2024, providing an overview of the current epidemiological situation.

Material and Methods

Ceva Lung Program methodology was applied consistently across participating slaughterhouses. Data were collected over a 12-month period, spanning mid-December 2024 to mid-November 2025, and included assessments from multiple EU countries. Median values were calculated for four key indicators: the proportion of lungs exhibiting bronchopneumonia (%BP), the percentage of affected parenchyma among diseased lungs, the prevalence of dorso-caudal pleurisy (%DP), and the APP Index (APPI).

Results

A total of 384,190 lungs from 3,755 scoring sessions were evaluated. Participation varied by country, with the majority of reports originating from Spain, France, Germany, and the Netherlands—countries collectively responsible for over half of EU pig slaughter. The overall median %BP was 31.76%. Among lungs presenting lesions, the median proportion of affected parenchyma was 4.35%. Median dorso-caudal pleurisy reached 8.7%, while the median APPI was 0.24.

Discussion and Conclusion

These results indicate that, at the European level, the burden of enzootic pneumonia and pleuropneumonia in 2024–2025 remains comparable to that observed in previous years using the same scoring system. The consistency of these findings underscores the value of routine slaughterhouse monitoring for tracking respiratory disease dynamics in swine populations.Cod: HHM-PP-44

HHM -PP-44

IMPACT OF SOW VACCINATION AGAINST ATROPHIC RHINITIS ON A POLISH PRODUCTION SYSTEM

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Background and Objectives

Atrophic Rhinitis (AR) is an infectious disease caused by the early piglets colonization of toxigenic strains of Bordetella Bronchiseptica and subsequent co-infection with Pasteurella multocida Type D during the fattening period, leading to Progressive Atrophic Rhinitis (PAR). This disease causes significant impairment of productive parameters, including growth performance. Its control is mainly based on the maternally derived antibodies transferred from vaccinated sows to their offspring. This study aimed to monitor the impact of sow vaccination with RHINISENG® in a production system previously diagnosed with a PAR problem.

Material and Methods

During a period of 4 and a half years, the weight in the slaughterhouse of a total of 92,652 individuals in 10 batches of 7,566 to 9,952 fattening animals each has been monitored. 5 batches corresponding to the NON-VAC group (44,745) and 5 after implementing the vaccination (VAC group; 47,907 pigs). The study was complemented by the evaluation of nasal lesions of 60 animals in each group.

Results

During the studied period, the live weight (98.17 ± 6.43 kilograms) of the VAC group was statistically significantly higher (p-value < 0.001; T-test) than the NON-VAC (92.44 ± 11.64 kilograms). Regarding the weight variability of each shipment to the slaughterhouse, the live weight was statistically significantly more homogeneous (p-value < 0.001; F test of variances) in the VAC group (coefficient of variation 6.55%) than in the NON-VAC (12.59%). The incidence of severe PAR lesions in VAC and NON-VAC finishers was 31.67% and 71.67%, respectively. The percentage of animals with moderate lesions was higher in the VAC group (18.33%) compared to NON-VAC group (13.33%). The percentage of animals with no or mild lesions was 50.00% in the VAC group compared to 15.00% in the NON-VAC group.

Discussion and Conclusion

Based on the observed results, vaccination with RHINISENG contributed to better nasal health, leading to greater growth and homogeneity.

HHM-PP-45

ECONOMIC IMPACT OF VACCINATION AGAINST EDEMA DISEASE IN A VTEC-POSITIVE FARM IN POLAND

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Background and Objectives

The vaccination against edema disease (ED) is a valuable tool in the reduction of financial loss in locations affected by verotoxin-producing Escherichia coli (VTEC). The main goal of our field trial was to evaluate the influence of ED vaccination on key performance indicators in a group of pigs reared in a modern VTEC-positive farm in Poland employing side-by-side testing.

Material and Methods

All the animals were born on a high-performing farrow-to-finish farm (1,200 sows) diagnosed with ED based on clinical signs and VTEC detection in PCR tests on oral fluids. The study was carried out using 519 suckling piglets. The individuals were randomly assigned at the third day of life to Group VAC (257 pigs immunised using VEPURED®) or Group NON-VAC (262). The piglets were ear-tagged in order to assure full traceability of the investigation. The pigs were mixed and offered the same condition: housing, feed and medication. Records regarding feeding days (FD), average daily weight gain (ADWG), mortality rates (MR), and total income per slaughter pig were monitored. The weight gain was evaluated individually for each animal. Statistical analysis was completed employing a logistic regression.

Results

The number of FD was significantly lower ($p<0.05$) in Group VAC (169.9 days) comparing to Group NON-VAC (173.4 days). ADWG during this period was higher in Group VAC (570 g/day) than in Group NON-VAC (548 g/day). The difference (22 g/day) was found to be highly statistically significant ($p<0.001$). MR tracked between weaning and slaughter was 3.1% and 8.2% for VAC and NON-VAC animals, respectively. The difference (5.1 pp) was defined as statistically significant ($p<0.016$). The extra income per every slaughter pig from Group VAC was €3.94 (vaccine cost deducted).

Discussion and Conclusion

Our report has proven that the administration of VEPURED® in VTEC-positive herds is an economically justified tool against negative impact of ED.

HHM-PP-46

PIGLET INTESTINAL HEALTH: COLIPROGRESS DIGITAL TOOL AND ANALYSIS OF PRODUCTION PERFORMANCE RESULTS FROM 130 FARMS VISITS

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Background and Objectives

A collaborative project was initiated to harmonize and standardize the approach to piglet gut health. The objectives of this study were first to describe the creation of the 'piglet gut health' diagnostic grid and its associated digital tool, and second, to analyze zootechnical data from 130 farms to identify which risks factors are well-managed and which require improvement in farrowing and post-weaning (PW) units.

Material and Methods

A visit grid was developed with four categories: husbandry, animal health, nutrition, and comfort/hygiene. This grid was digitized into the ColiPROGRESS web application, designed for on-farm and at desk use by veterinarians and technicians. This new tool facilitates data entry, automated reporting, and data extraction for analysis, what is extremely useful and new. This study is based on an analysis of 130 farms visits conducted between January 2024 and May 2025 in France, mostly in farms known to have PW digestive issues.

Results

Well-managed factors were dry rooms at pig entry (83% respondent in maternity and 93% in PW), good water quality, cross-fostering proportion less than 20% of litters, and same feed before and after weaning, feed presentation and formula. Key areas for improvement included hygiene protocols, with only 40% of respondents in maternity and 28% in PW verifying the quality of cleaning and disinfection. Furthermore, 78% of respondents pre-heated PW rooms for less than the recommended 48 hours. Other significant weaknesses were found in the management of neonatal diarrhea, piglet weight homogeneity, absence of use of detergent, creep feeding practices and feeder adjustments over time.

Discussion and Conclusion

The analysis highlights a clear need to reinforce protocols around piglet homogeneity (age and weight), hygiene (pre-heating, use of detergents) and precise feed management. The digital tool, by enabling national benchmarking and tracking progress over time, provides an essential framework for developing targeted action plans and driving continuous improvement in piglet intestinal health.

HHM-PP-47

IS THYMULIN DEFICIENCY A KEY EVENT IN PORCINE PERIWEANING FAILURE TO THRIVE SYNDROME?

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Background and Objectives

Porcine Periweaning Failure to Thrive Syndrome (PFTS) is an emerging disease affecting swine production, characterized by growth retardation and progressive debilitation within the first two to three weeks after weaning. A prominent and reported lesion in affected piglets is thymic atrophy, although its underlying mechanisms remain poorly understood. This study aims to characterize thymic alterations and if they are correlated to serum levels of thymulin.

Material and Methods

Samples from lymphoid organs (thymus, tonsil, lymph node and spleen) and serum from 60 piglets (5 healthy and 5 sick from six affected Spanish farms) were taken for histopathological and serological studies. Three of the farms raised Iberian pigs and three raised white pigs, enabling evaluation of potential differences between breed and management factors.

Results

Histopathological study of the thymus revealed qualitative and quantitative differences between healthy and affected piglets. Sick animals showed a progressive loss of cortex/medulla ratio and increased Hassall's corpuscles diameter and density, compatible with early thymic involution. Despite this, no evidence of lymphocyte depletion was detected in secondary lymphoid organs. These findings were correlated with significant reduced thymulin concentrations in serum of affected animals, suggesting impaired thymic endocrine function.

Discussion and Conclusion

Severe thymic atrophy, characterised by a decrease in the cortex/medulla ratio, an increase in size of Hassall's corpuscles, and the maintenance of T lymphocyte population in secondary lymphoid organs, point to an early thymic involution as main event in PFTS. This involution was correlated with a decrease, in serum, of thymulin, a thymic hormone linked in humans with anorexia nervosa which could contribute to growth retardation and thymic involution in affected animals, reason for which the serum levels of thymulin could be used as a diagnostic biomarker. As zinc deficiency is a known cause of reduced thymulin levels, it may play a role in PFTS etiology, although further research is required.

HHM-PP-48

EFFECTS OF INJECTABLE COMBINED GLEPTOFERRON AND TOLTRAZURIL ON ENHANCING THE QUALITY OF WEANED PIGLETS.

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Background and Objectives

Traditional prevention of iron deficiency anemia (IDA) and coccidiosis in piglets involves iron injection during the first 1–3 days of life and oral toltrazuril on days 3–5. A combined injectable product containing toltrazuril and gleptoferron (Forceris®) has recently been developed. This study aimed to compare weaned piglet quality, specifically weaning weight and weight distribution, after switching from iron dextran plus oral toltrazuril to injectable combined gleptoferron and toltrazuril.

Material and Methods

Retrospective data from 2024 were collected from a single farm with a history of coccidiosis, including 89,000 weaned piglets. Piglets weaned from January to June received iron dextran and oral toltrazuril (46,941 piglets), while those weaned from August to December received injectable combined gleptoferron and toltrazuril (42,059 piglets). Piglets weaned in July were considered transitional. Weaning weights were measured at 21 days of age. A two-sample t-test was used to analyze weight differences between the two groups.

Results

Piglets treated with injectable combined gleptoferron and toltrazuril had significantly higher weaning weights than those treated with iron dextran and oral toltrazuril (5.70 vs. 5.25 kg; $p<0.01$). A clear upward trend in average weaning weight was observed starting in August, coinciding with the introduction of the injectable protocol. Moreover, the proportion of piglets exceeding the 5.0 kg (optimal target weight) increased substantially when the injectable combination was used (82.7% vs. 59.7%).

Discussion and Conclusion

Injectable treatment improved both weaning weight and the proportion of heavier piglets. The enhanced performance is likely due to superior pharmacokinetics of toltrazuril and its metabolite in intestinal tissues, better treatment compliance via injection, and the expected higher efficacy of gleptoferron over iron dextran in preventing IDA. Improved control of coccidiosis and IDA contributed to better growth performance during the farrowing period.

HHM-PP-49

CHALLENGING THE SEASONAL CALENDAR: OUT-OF-SEASON CIRCULATION OF PANDEMIC SWINE INFLUENZA (H1PDMN1PDM) AND ITS ECONOMIC IMPACT ON A FARROW-TO-FINISH FARM IN BRITTANY

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Background and Objectives

This case describes an atypical summer outbreak of H1pdmN1pdm, followed by secondary infections in a 110-sow partial farrow-to-finish farm in Brittany. The aim was to document the chronology, evaluate production losses and estimate the economic impact over one full cycle.

Material and Methods

The outbreak began in June 2023 with severe respiratory signs (anorexia, dyspnea, hyperthermia) in sows. PCR from individual oral fluids and nasal swabs confirmed the H1pdmN1pdm strain. Respiratory signs later appeared in piglets (from lactation through the grower/finisher stages). In growing sick pigs, Porcine Circovirus type 2 (PCV2) from blood samples and Mycoplasma hyopneumoniae (M. hyop) from tracheobronchial swabs were detected by PCR and necropsies revealed severe lesions associated with these infections. Production data from one complete cycle (7 batches) before, during and after the acute phase were collected and extrapolated to assess the annual economic impact.

Results

The H1pdmN1pdm infection occurred far outside the typical influenza season. While clinical signs in sows resolved quickly, a secondary complex emerged, characterized by PCV2 and M. hyop detection on growers/finishers. The episode caused a reduction in weaned piglets per batch (-20.6%). As the farm operates as a partial farrow-to-finish farm, this decline resulted in fewer piglets sold at weaning. The estimated economic impact for the 7 batches was 11,637€ in gross profit losses, with reduced weaner sales representing 7,918€ of this amount.

Discussion and Conclusion

This case shows that the H1pdmN1pdm strain can circulate outside the usual seasonal windows, presenting a significant risk even during summer. The initial viral infection acted as a trigger, amplifying co-infections with M. hyop and PCV2, leading to measurable production losses. Detailed economic calculations for such field cases are rarely published. This case highlights the importance of continuous surveillance and diagnostic monitoring that include pandemic strains, regardless of the calendar.

HHM-PP-50

APPLICATION OF A ℜ-MANNANASE ENZYME IN DIETS WITH REDUCED NET ENERGY DURING THE EARLIER FATTENING PERIOD RESULTED IN EQUAL PERFORMANCE AND AN ADDITIONAL ECONOMIC BENEFIT

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Background and Objectives

®-Mannans are strongly anti-nutritive polysaccharide fibers found in most vegetable feed ingredients. The estimated content of soluble ®-mannans in common fattening diets is only 0.20-0.35%, and in vitro studies have demonstrated that as little as 0.05% soluble ®-mannan in feed can elicit a strong innate immune response. Hemicell HT (Elanco) is a ®-mannanase enzyme for animal feed that breaks down ®-mannans. The aim was to evaluate the impact of a 45 and 63 kcal net energy reduction on performance in first phase fatteners.

Material and Methods

A 36-day feeding trial was conducted on a commercial fattening facility with DanBred x Belgian Piétrain pigs starting at 10 weeks of age. Pigs were randomly allocated to one of the 3 treatment groups: Control, 45 kcal NE reduction + Hemicell HT, 63 kcal NE reduction + Hemicell HT. Standard production data were collected. The data were analysed using JMP 17.1 statistical program.

Results

During the first phase of fattening (36 d), no significant differences among the 3 treatment groups (Control, 45 kcal/kg NE reduction + Hemicell HT, 63 kcal/kg NE reduction + Hemicell HT) were observed concerning feed consumption, growth, feed conversion, average daily weight gain or mortality.

Discussion and Conclusion

The trial demonstrated that both a NE reduction of 45 kcal/kg and 63 kcal/kg with supplementation of Hemicell HT resulted in similar performance results as the pigs fed the Control diet with the full NE content. Therefore, supplementation of Hemicell HT to fattening diets can help to reduce the cost of the formulated feed through a decrease of 45-63 kcal NE per kg of feed.

HHM-PP-51

DEVELOPMENT OF AN ALGORITHM FOR CONTACTLESS WEIGHT MEASUREMENT OF FATTENING PIGS WITH OUTDOOR ACCESS USING IMAGE RECOGNITION

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Background and Objectives

Manual weighing of fattening pigs using scales is essential to determine the slaughter date and to monitor weight gain. However, manual weighing is very time-consuming and causes significant stress for both animals and humans. The aim of this study was to develop an image recognition algorithm to estimate the weight of fattening pigs ranging from 25 kg to 120 kg in a farm with multiple climate zones (free outdoor access).

Material and Methods

A camera system was installed on a Swiss fattening farm with 400 pigs separated in eight pens with 50 animals each. Four 2D camera were mounted on the ceiling of the indoor and outdoor area. All pigs were manually weighed to create a training and test dataset. Pigs were individually marked on the back to ensure re-identification within each pen. Weight estimation was then performed using two algorithms. One working with an overall box (Area Boxes) and the other working with segmental boxes (Segmentation) of the pig surface images. The accuracy of the algorithms to estimate the correct individual pig weight was calculated using the manual weighing results as a gold standard.

Results

113 and 76 images were used for training and testing respectively. Both algorithms were able to calculate the average weight and the distribution of weight in each of the eight pens. Pens with newly housed pigs and pens with pigs close to slaughter were identified at group level with lower standard deviations. On the individual pig weighing level, the Area Boxes and the Segmentation algorithm showed a total accuracy of 0.73 and 0.76 respectively.

Discussion and Conclusion

To our knowledge, the data demonstrate for the first time a feasible weight estimation using an image-recognition-based algorithm during the complete fattening period in pigs with outdoor access. This provides a cornerstone for contact-free, stress-free animal weighing and automated animal health monitoring.

HHM-PP-52

MICROENCAPSULATED ESSENTIAL-OIL BLEND IN LACTATION IMPROVES PIGLET SURVIVAL AND NET INCOME IN A COMMERCIAL SOW HERD

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Background and Objectives

Lactation is a critical phase for herd profitability because high metabolic demand can compromise piglet survival and growth. This study investigated the effects of adding a microencapsulated essential-oil blend (EMERALD) to lactation diets on litter growth, pre-weaning survival, and net income under commercial herd conditions.

Material and Methods

A total of 1,000 multiparous sows were randomly assigned to the control or treated group (500 per group). Treated sows received 100 g/t of EMERALD in the diet from one week before farrowing until weaning (27 d). Piglet weights were recorded at weaning and at 69 d of age. Mortality was recorded from farrowing to weaning and from weaning to 69 d of age. Weaned piglets were kept in separate pens by maternal treatment. Diets were coded and farm personnel were blinded to treatment identity. Data were analysed using mixed models with treatment as a fixed effect and sow batch (production batch) as a random effect. P-values were obtained from F-tests; treatment effects are presented with 95% confidence intervals, and significance was declared at $P < 0.05$.

Results

Supplemented sows weaned more piglets (11.61 vs. 12.53; P = 0.021), with higher weaning weight (6.48 vs. 7.23 kg; P = 0.038) and lower pre-weaning mortality (farrowing to weaning) (5.73 vs. 2.49%; P = 0.013). At 69 d of age, pigs from treated sows were heavier (27.9 vs. 28.8 kg; P = 0.042).

Discussion and Conclusion

Supplementing a microencapsulated essential-oil blend in lactation diets improved survival and growth, resulting in 0.92 additional weaned piglets/sow and 35.9 kg more live weight per litter at 69 d of age. Net income was calculated from live weight at 69 d of age (fixed price) and sow feed costs; despite a 3.6 €/sow increase in feed cost, net income increased by 53.8 €/sow, indicating a cost-effective strategy to improve herd profitability.

HHM-PP-53

ENERGY REFORMULATION IN LATE NURSERY PIGS: REPLACING ADDED FAT WITH A GLUCONEOGENIC FEED ADDITIVE MAINTAINS PERFORMANCE AND REDUCES DIET COST

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Background and Objectives

Lipid sources are among the costliest components of pig diets, and fluctuating fat prices hinder the economic efficiency in nursery pig production. This study evaluated whether an energy-dense gluconeogenic feed additive (SOLERGY) could partially replace added fat in late nursery diets while maintaining growth performance and lowering feed cost.

Material and Methods

A total of 450 crossbred pigs (initial BW ±1.7 kg) were allocated to 45 pens (10 pigs/pen) and assigned to three treatments (15 pens/treatment) for 20 days. Corn–soybean–DDGS diets were standardized form metabolizable energy (ME; 3.27 Mcal/kg) and standardized ileal digestible lysine (1.25%). The control diet contained 1% choice white grease; in test diets, 33 or 67% of the added fat was replaced by the additive at 0.033 or 0.067% inclusion using an ME matrix value of 78,000 kcal/kg. Body weight, average daily gain (ADG), feed intake (ADFI) and feed efficiency (F:G) were measured; pen was the experimental unit and data were analysed by one-way ANOVA (GLM), with significance declared at $P < 0.05$.

Results

No significant differences were observed among treatments for final body weight (±23.3–23.6 kg), ADG (0.585–0.594 kg/d), ADFI (0.866–0.876 kg/d) or F:G (1.48–1.51; all $P > 0.10$), and no mortality occurred. Formulating with the additive reduced diet cost by 2.0 and 4.1 US$/t of feed at 33 or 67% fat replacement, respectively, equivalent to approximately 0.04 and 0.07 US$/pig over 20 days based on observed feed intake.

Discussion and Conclusion

Under late-nursery conditions, partially replacing added fat with a gluconeogenic feed additive maintained growth performance while reducing overall feed cost.

HHM-PP-54

INFLUENCE OF THE LAST THIRD OF THE GESTATION IN THE YOUNG SOW ON ITS RETENTION RATE ON THE FARM

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Background and Objectives

During first gestation, gilts support fetal growth while finishing their own development, increasing nutritional demands and tissue mobilization. This study assessed growth dynamics in gestation—especially the last third—and their effect on muscle loss, body condition, and retention rate (% gilts entering the herd that wean ε3 litters), and whether biochemical markers reflect muscle catabolism.

Material and Methods

A total of 144 Topigs TN70 gilts were monitored from insemination to weaning. Body weight, backfat thickness, and longissimus dorsi muscle depth and area were measured at insemination, day 85 of gestation, pre-farrowing, and weaning. Blood samples from 21 gilts randomly selected at the beginnning of the study were analyzed for creatine kinase (CK) and other biochemical parameters. Statistical analysis included correlations and regression models.

Results

Weight increased from 173 ± 14.4 kg at insemination to 193.2 ± 15.1 kg at weaning, indicating adequate overall growth. Backfat peaked at farrowing (12.4 mm) and declined to 10.1 mm during lactation. Muscle depth and area decreased progressively, with an average loss of 3.3 mm in the last third of gestation; 50% of gilts lost up to 6.4 mm, reflecting insufficient protein supply during rapid fetal growth. CK did not differ significantly between late gestation and farrowing, suggesting limited value as a muscle loss marker. However, changes in urea and glutamic oxaloacetic transaminase (GOT) were observed, potentially linked to metabolic stress and retention outcomes.

Discussion and Conclusion

Late gestation imposes critical nutritional challenges, leading to muscle mobilization when dietary protein is insufficient. Optimizing feeding strategies during this phase is essential to minimize tissue loss and improve sow longevity. Biochemical indicators such as urea and GOT may warrant further investigation for their association with retention risk. Unfortunately, not all gilts had completed three weanings at abstract submission, so retention rate results could not be included.

HHM-PP-55

THE INFLAMMATORY COMPONENT OF DIARRHEIC GROWING PIGS ACCORDING TO SALIVARY ANALYTICS.

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Background and Objectives

The gastrointestinal tract at early growing phase experiences inflammation that ultimately could cause diarrhea. Salivary carbonic anhydrase VI (VI) is considered a gastrointestinal protective protein, however a possible link with inflammation has been recently suggested. We have evaluated the overall inflammatory condition of diarrheic growing pigs and its possible connection with the behavior of salivary CA VI.

Material and Methods

125 healthy and 66 diarrheic growing pigs (28 with liquid diarrhea, 18 with hemorrhagic diarrhea and 20with greenish-yellow diarrhea) from commercial growing farms in the southeast of Spain were used. Individual saliva samples were collected during routine veterinary examination and the salivary inflammatory parameters (CRP, Hp, Pig-MAP, ADA and S100A12) and CA VI were quantified using previously validated salivary assays.After outlier removal, the possible differences in the inflammatory intensity of the diarrheic pigs and the levels of CA VI were statistically analyzed using multiple comparison ANOVA test and Cohen d size effect.

Results

The highest levels of inflammatory biomarkers appeared in pigs with liquid diarrhea for the Pig-MAP, ADA and S100A12 in comparison to healthy pigs as well as for salivary CA VI. The group of diarrheic pigs with greenish-yellow diarrhea showed the highest mean levels of Hp showing a more chronic pathology next to a moderate increase in ADA and CA VI levels. Only CRP and Hp showed increases in the group of pigs with hemorrhagic diarrhea.

Discussion and Conclusion

The maximum inflammatory condition according to the salivary biomarkers appeared in pigs with liquid diarrhea in which the highest levels of CA VI were observed. Salivary CA VI seems to have a connection with the inflammatory condition of the gastrointestinal tract. Granted by PID2020-116310RB-I

HHM-PP-56

METABOLIC MONITORING IN SOWS: POOLED SAMPLES AS A PRACTICAL AND COST-EFFECTIVE ALTERNATIVE TO INDIVIDUAL TESTING.

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Background and Objectives

Periparturient disorders in sows remain a relevant challenge in pig production. Metabolic imbalances may contribute to these issues. Interest in metabolic testing is increasing, although individual analyses are expensive. Pooling of blood samples, as used in dairy herds, could reduce costs. Therefore the objective of this study was to evaluate whether pooled serum samples provide comparable results to individual samples in periparturient sows.

Material and Methods

On seven sow herds, without periparturient health issues, blood samples were collected from five primiparous and ten multiparous sows two weeks pre- and two weeks post-partum**.** Individual serum samples were analyzed for total protein, albumin, calcium(Ca), phosphorus(P), magnesium(Mg), creatinine, GGT, and NEFA's. In parallel, pooled samples were prepared by combining equal volumes of serum from five individual sows under laboratory conditions. Because the aim was method validation rather than detection of group differences, pooled measurements were compared with the mean of the corresponding individual samples using agreement-based statistical methods such as Lin's concordance correlation coefficient (CCC) and Bland–Altman analysis.

Results

Pooling provided a very good agreement with individual-mean concentrations for creatinine (CCC=0.99), Ca (CCC=0.96), total protein (CCC=0.98), and P (CCC=0.98), with small bias and narrow limits of agreement. Albumin showed a weaker but still acceptable agreement (CCC=0.82), while GGT showed a high agreement (CCC=0.91) but also higher variability. In contrast, pooling proved unsuitable for NEFA's due to substantial bias and poor agreement (CCC=0.007).

Discussion and Conclusion

The validity of pooled serum sampling is strongly analyte-dependent. When evaluated using appropriate agreement-based criteria, pooled samples accurately reflect herd-level metabolic status for multiple metabolites while reducing costs compared with individual testing. Although pooling was performed in the laboratory, the cost does not outweigh the savings achieved by reducing the number of analyses. Pooling represents a practical and economical tool for metabolic monitoring in sow herds, provided metabolite-specific limitations are considered.

HHM-PP-57

PROTECTED BENZOIC ACID REDUCES INTESTINAL INFLAMMATION AND ENHANCES PERFORMANCE IN NURSERY PIGS

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Background and Objectives

Benzoic acid is a well-established organic acid with antimicrobial and anti-inflammatory properties. Its effectiveness depends on its delivery to targeted segments of the gastrointestinal tract. This study evaluated the supplementation of protected benzoic acid (**PBA**; Provenia Feed Solution, NOVUS International, Chesterfield, MO) for 35 days on growth performance, medication use, and intestinal inflammation in commercial weaned pigs reared without pharmacological ZnO.

Material and Methods

A total of 656 pigs (Camborough × PIC 337; 26 days of age; 7.04kg of body weight; half gilts and half barrows) were allocated to 68 pens with treatment applied to pen based on average pen weight (n=34) a control diet or the same diet supplemented with PBA at 2.5kg/MT for 35 days. Diets were offered across 4 feeding phases (19–17% crude protein). Growth performance, survivability, and health parameters were monitored. Fecal calprotectin and myeloperoxidase concentration was analyzed on day 34 as a marker of intestinal inflammation.

Results

Pigs fed PBA were 1.8 kg heavier at 35d (22.4 vs. 20.5kg; P<0.001) as a result of a greater average daily gain (0.446 vs. 0.395kg; P<0.001) compared to control. Inclusion of PBA was associated with a numerically lower final body weight coefficient of variation of 13.6 compared to 14.5% for control. (P=0.351). Feed conversion ratio was 5 points lower for the PBA treatment (1.49 for PBA and 1.54 for control; P=0.213). Number of individual animal medications were 32% lower for the PBA group (186 vs. 273; P<0.001). PBA reduced fecal calprotectin and myeloperoxidase by 20% and 24% (0.481 vs. 0.598ug/g, P=0.030 and 0.295 vs. 0.386mU/mg protein, P=0.007), indicating decreased intestinal inflammation that aligns with fewer individual treatments.

Discussion and Conclusion

These results indicate that 2.5kg/MT PBA ameliorates intestinal challenge as observed by lower calprotectin, myeloperoxidase and medications which was subsequently associated with greater gain, final weight, and lower feed conversion.

HHM-PP-58

EVALUATING PRODUCTION AND TRANSPORT FACTORS OF TRANSIT LOSS IN MARKET HOGS AND PREDICTING LOADS WITH LOSSES USING MACHINE LEARNING.

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Background and Objectives

Transporting pigs from farms to abattoirs is the final stage before marketing, during which transit loss (TL), referring to pigs that die or become non-ambulatory, leads to economic and welfare concerns. Because TL arise from multiple interacting factors and related data are often fragmented, identifying causes is challenging. This study aimed to analyze combined impact of different-level factors on TL and use machine-learning methods to predict the risk.

Material and Methods

We analyzed 30,460 transport records from 1,938 finishing batches across 350 US Midwest sites (January 2022 to May 2025). A negative binomial mixed-effects model was built with manual stepwise selection to estimate the per-load TL ratio and compared it across variable categories. An XGBoost model with an 80:20 split was applied to classify loads with high or low TL and generated a truck score by scaling the negative predictive value from 0 to 10.

Results

The average TL per load was 1.08% (95% CI: 1.07–1.11). Of the 33 initial variables, 15 entered the final model. Sites using wet–dry feeders, batches with lighter pigs upon arrival, higher average daily feed intake (ADFI), or without PRRSV vaccination, associated with higher TL risk. TL was also more likely for loads transported in fall or winter and later cuts. At the truck level, heavier individuals and entire truck, and uneven weight distributions increased TL probability. The XGBoost model achieved 0.7005 accuracy (95% CI: 0.6888–0.712; sensitivity: 0.6868; specificity: 0.7139), and its truck score served as a risk indicator, with lower scores corresponding to higher TL and showing a −0.573 Pearson correlation.

Discussion and Conclusion

Pigs with poorer health or lower growth performance show higher TL, and cold seasons further increase this risk. Optimizing transport timing and balancing load composition can help reduce losses and improve welfare. Machinelearning models provide probability-based TL pre-assessment by assigning a truc score.

HHM-PP-59

EFFECT OF SUPPLEMENTING PHYTOGENIC COMPOUNDS TO STANDARD OR SAFE DIETS ON GROWTH PERFORMANCE, STOOL QUALITY AND HEALTH STATUS OF POST-WEANING PIGLETS.

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Background and Objectives

Weaning piglets are highly susceptible to enteric disease, often associated with impaired feed intake and growth. Phytogenics are proposed as a nutritional strategy to address this challenge.
This study evaluated the effects of phytogenics on growth, stool quality, and health status of post-weaning piglets fed two diet types.

Material and Methods

A total of 2677 piglets [DanbredxDuroc, 26d, 5.2±0.06 kg] were allocated to 4 treatments in a 2x2 factorial design (n=20 pens/treatment): (1) diet type (standard vs. safe) and (2) Cinergy™ Protect (CPr) supplementation (0 vs. 1 kg/mT feed, Cargill Animal Nutrition & Health).
Safe diets included higher levels of fiber and milk protein. Experimental diets were given from d0-12, followed by a common diet until d40.
Piglet's LW was measured at d0, d12 and d40; feed intake recorded, and average daily gain (ADG), average daily feed intake (ADFI) and feed conversion ratio (FCR) calculated. Mortality, removals, fecal score and antibiotics use were monitored.
Data were analyzed using Linear Mixed-Effects models in R (v4.3.2).

Results

In phase 1 (d0-12), no interaction between diet and CPr was observed for LW, ADG, ADFI or FCR ($P>0.10$); however safe diets improved LW_d12, ADG_phase1 and FCR_phase1 ($P<0.05$).
Overall, a tendency towards interaction ($P=0.08$) was found for LW_d40, ADG, ADFI, and FCR: CPr improved performance when added to safe diets but had no impact when supplemented to standard diets.
Fecal scores were similar across treatments.
Piglets fed safe diets had lower mortality, removals and antibiotic treatments than piglets fed standard diets. Mortality and removals decreased from 8.09% to 4.34% when CPr was supplemented to the standard diets.

Discussion and Conclusion

CPr shows great potential to improve feed intake and growth in scenarios where safe type diets are used and mortality and removals kept low. When standard diets are fed, the supplementation of CPr shows potential to reduce mortality, removals and antibiotic use.

HHM-PP-60

QUALITATIVE RISK ASSESSMENT OF THE INTRODUCTION OF AFRICAN SWINE FEVER THROUGH MARITIME PORT ACTIVITY IN THE BíO-BíO REGION BETWEEN 2018 AND 2023

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Background and Objectives

African swine fever (ASF) is an infectious disease that affects domestic and wild pigs. The disease spreads easily and has a significant impact on international trade, posing a threat to global pig production. Although it has never been detected in Chile, the possibility of its introduction through maritime trade is a cause for concern for the livestock sector. The aim of this study is to assess the potential risk of ASF entering the Bío-Bío region through seaports between 2018 and 2023.

Material and Methods

Records from the Bío-Bío Agricultural and Livestock Service (Servicio Agrícola y Ganadero [SAG]) relating to ships, inspections, passengers and the disposal of products intercepted at the ports of Coronel, Lirquén, San Vicente and Talcahuano were used. Risk was estimated using descriptive probability and impact scales, which were categorised into four levels: negligible, low, moderate, and high. Probability was calculated based on frequency distribution and adjusted using health data and maritime traffic characteristics. For impact, scientific sources and health databases were analysed.

Results

The data collation identified the main entry routes. This was achieved by analysing 5,081 records of ships, 43,635 passengers entering the country, 208 interceptions and 194 eliminations submitted by the national agency.
The combination of probability and impact made it possible to classify the overall risk using a qualitative risk matrix. This identified the most critical factors within maritime port activity in the Bío-Bío region. Notably, frequent arrivals from East Asia (15.3% of arrivals) and Latin America and the Caribbean (61.5%) stood out, as these are regions with an endemic presence of the virus.Within port activities, waste management and the handling of meat products in warehouses (stores) were identified as critical situations.

Discussion and Conclusion

Within port activities, waste management and the handling of meat products in warehouses (stores) were identified as critical situations.

HHM-PP-61

RELATIONSHIP BETWEEN MICROBIAL SHIFTS, INTESTINAL INFLAMMATION, AND MUCOSAL MORPHOLOGY IN THE EARLY POST-WEANING DAYS IN PIGLETS

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Background and Objectives

Weaning triggers intestinal inflammation, compromises gut structure, and alters microbiota composition. This study aimed to assess the relationship between local intestinal inflammation, assessed via the faecal biomarkers' calprotectin and myeloperoxidase, tissue architecture, and faecal microbiota during the post-weaning period.

Material and Methods

A total of 18 piglets (21 days) were selected, with faecal and intestinal tissue samples collected from nine animals on days 3 and 14 post-weaning. Faecal calprotectin was analysed by immunoturbidimetry and MPO by o-dianisidine oxidation. Faecal microbiota was profiled by 16S rRNA sequencing, while intestinal morphology and mucosal cell infiltration were evaluated by light-microscopy.

Results

Although calprotectin levels remained stable between days ($P = 0.596$), MPO nearly doubled by day 14 ($P = 0.011$). Villus height increased by ~20% ($P = 0.027$), yet intraepithelial lymphocyte counts also nearly doubled ($P = 0.064$). Beta diversity revealed shifts in microbial composition between sampling days ($P = 0.011$). On day 3 and 14 post-weaning, the microbiota was dominated by Firmicutes (70%), Bacteroidota (19%), while Proteobacteria shifted from 4.5 to 0.2% on day 14 ($P < 0.001$). Genus-level comparisons showed reductions in diarrhoea-associated taxa from day 3 to 14 post-weaning, such as Streptococcus (7% to 1.4%, $P = 0.010$) and Escherichia–Shigella (3% to <1%, $P < 0.001$). Notably, decreases in genera involved in carbohydrate digestion, including Prevotella (8% to 5.2%, $P = 0.004$) and Prevotellaceae_NK3B31_group (1.1% to <1%, $P = 0.004$), as well as lipid-metabolizing genera such as Bacteroides (3% to <1%, $P < 0.001$). Conversely, by day 14, the dysbiosis-associated genus Terrisporobacter increased from <1% to 5% ($P = 0.010$).

Discussion and Conclusion

The present findings suggest that, despite structural improvements and a reduction in some opportunistic taxa over the post-weaning period, intestinal inflammation persists. This sustained inflammatory state appears to be related not by residual pathogens, but rather by the loss of beneficial microbiota.

HHM-PP-62

LARGE-SCALE CHARACTERIZATION OF SLAUGHTERHOUSE PNEUMONIA IN BRAZIL: HISTOLOGICAL SIGNATURES, PATHOGEN DETECTION AND COINFECTION DYNAMICS

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Background and Objectives

Respiratory lesions detected at slaughter remain one of the most practical and high-value tools for assessing herd respiratory status. However, little multicentric data exist describing the complex interaction between pathogens and histological patterns in large-scale Brazilian swine systems. This study provides a broad two-year overview combining evaluations from multiple regions to characterize lesions, identify etiologic agents, and determine coinfection patterns in slaughtered pigs.

Material and Methods

A total of 75 slaughter assessments were performed across seven Brazilian states between 2024 and 2025. From these, 668 lungs were submitted for histopathology, and bacteriological culture was performed in pools of 3–5 lungs. Histological examinations followed established criteria for lesions associated with Mycoplasma hyopneumoniae (MHY), influenza A virus (IAV), and bacterial pathogens. Cultures targeted Pasteurella multocida, Actinobacillus pleuropneumoniae, and A. suis under species-specific selective conditions.

Results

Only 3.76% of lungs showed no primary lesions or secondary bacterial involvement. MHY-associated and IAV-associated lesions were identified in 46.1% and 42.1% of lungs, respectively, with MHY+IAV coinfection detected in 23.65% of cases. Bacterial bronchopneumonia occurred in 31.73% of lungs and was most frequently observed in those with single MHY or IAV infections. Fibrinonecrotic pleuropneumonia was present in 18.42% of samples, predominantly in lungs lacking primary MHY or IAV lesions. Pleuritis was observed in 20.81% of lungs. Bacteriological analysis identified P. multocida in 66.67% of evaluations, followed by A. pleuropneumoniae (20%) and A. suis (6.67%).

Discussion and Conclusion

These findings reveal a high burden of overlapping respiratory insults at slaughter and confirm the central role of MHY, IAV, and P. multocida in the Brazilian Swine Respiratory Disease Complex. The strong interaction between viral and bacterial pathogens highlights the need for integrated monitoring and coordinated control programs to reduce chronic lesions and performance losses in modern production systems.

HHM-PP-64

CHANGES IN SELECTED BLOOD BIOCHEMICAL PARAMETERS IN GILTS AND SOWS DURING THE PERIPARTURIENT PERIOD

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Background and Objectives

The periparturient period in pigs is associated with marked metabolic and physiological changes that may affect blood biochemical parameters. The aim of this study was to assess alterations in selected biochemical parameters in gilts and sows during the periparturient period.

Material and Methods

Blood samples were collected from 7 gilts and 7 sows at 35d, 7d and 12h before, and 7d after farrowing. Concentrations of Crea, Urea, ALP, ALT, AST, TP, ALB, Ca, Mg, P, Fe were analysed. Data were analysed using a longitudinal repeated-measures mixed-effects model to assess the effects of group, time and their interaction; statistical significance was set at $p<0.05$.

Results

Sows showed significantly higher Crea at all time points (group effect:$p=0.003$). Crea ranged from 186.6 at 35d before farrowing to 224.5 µmol/L 12h before farrowing in gilts, and from 200.4 to 241.2 µmol/L in sows. Iron were higher in gilts and declined in both groups towards a nadir after farrowing. ALP was higher in gilts ($p=0.031$), with a significant effect of time ($p<0.001$) and a group×time interaction ($p=0.007$). In gilts, ALP decreased from 95.3 U/L at 35d before farrowing to 46.2 U/L 12h before farrowing, followed by an increase after farrowing. ALT awas higher in gilts ($p=0.001$) and decreased over time in both groups ($p<0.001$). TP, ALB reached their lowest concentrations 12h before farrowing. Ca were lowest 12h before farrowing and increased post-partum, P decreased and Mg increased after farrowing in both groups.

Discussion and Conclusion

The periparturient period is characterised by distinct metabolic changes in pigs that differ between gilts and sows. These findings highlight the importance of parity in the interpretation of biochemical parameters and support improved metabolic monitoring in swine production.

HHM-PP-65

EVALUATION OF THE MAIN PATHOGENS INVOLVED IN SWINE DIARRHOEA AT DIFFERENT PRODUCTIVE PHASES LOCATED IN THE NORTHEASTERN OF SPAIN.

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Background and Objectives

Diarrhoea continues to compromise health and productivity in swine herds, particularly under reduced antibiotic use and the withdrawal of zinc oxide. Its aetiology varies across production stages, making field data essential for effective control strategies. This study investigated the main pathogens involved in diarrhoeal outbreaks in commercial farms in Northeastern Spain across lactation, nursery and fattening.

Material and Methods

A total of 450 rectal swabs were collected from ten breeding herds and its corresponding nursery and fattening unit between October 2024 and May 2025. From each farm, 15 individual samples were taken and tested against the main digestive pathogens by PCR in pools of 5 samples. Detection prevalence was calculated as the proportion of positive pools. Statistical differences between production stages were considered when $p<0.05$.

Results

The most frequent agents detected in lactation were E. coli (100%; 30/30), Clostridium perfringens type A (80%; 24/30), C. difficile (43.3%; 13/30) and rotavirus A and C (40%; 12/30 each). The most prevalent E. coli pathotypes were EPEC and ETEC, and toxins 〈 (80%; 24/30) and ®2 (73.3%; 22/30) dominated in C. perfringens pools. In nursery, E. coli remained predominant (100%; 30/30) with F18 (73.3%; 22/30). Cryptosporidium spp. (23.3%; 7/30) and PEDV (20%; 6/30) were also detected. In fattening pigs, PEDV (20%; 6/30), Cryptosporidium spp. (10%; 3/30) and Lawsonia intracellularis (10%; 3/30) were identified. No significant differences in pathogen prevalence were found between studied productive stages ($p>0.05$).

Discussion and Conclusion

These results confirms that co-infections occur frequently during the lactation and nursery phases in farms located in Northeastern of Spain, but these are uncommon in fattening period. Therefore, multifactorial control strategies, with measures adapted to each productive phase, should be implemented for controlling digestive disorders in pig farms.

HHM-PP-66

PREVALENCE OF NEONATAL DIARRHOEA PATHOGENS IN PERU

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Background and Objectives

Neonatal diarrhoea in piglets is a multifactorial disease influenced by infectious, environmental, and management factors. Clostridioides difficile is an emerging pathogen that causes diarrhoea in the first week of life and is associated with increased pre-weaning mortality, reduced growth, and lower weaning weights. This study investigated the prevalence of major neonatal diarrhoea pathogens in piglets suffering from diarrhoea in Peru.

Material and Methods

A total of 108 piglets from 12 farms were analysed in the study between June 2022 and June 2025. Samples were collected from piglets with scours, fixed on FTA® ELUTE cards (Whatman), and sent to the DIAGNOS® Laboratory (Lima, Peru). A multiplex quantitative polymerase chain reaction (qPCR) assay was performed to detect genes from Escherichia coli, Clostridium perfringens (types A and C), Clostridioides difficile, Rotavirus (groups A [RVA] and C [RVC]), and Porcine Epidemic Diarrhoea virus (PEDV).

Results

All samples (100%) tested positive for Clostridium perfringen type A, 34% showing a high bacterial load (Ct < 26). Clostridioides difficile was detected in 41% of samples, of which 17% had Ct < 30. As for viral agents, RVA was identified in 27% of samples, RVC in 17%, and PEDV in 10%.

Discussion and Conclusion

Neonatal diarrhoea cases in Peruvian piglets showed a high prevalence of Clostridium perfringens and frequent detection of C. difficile and viral agents, confirming its multifactorial nature. These findings highlight the need for integrated diagnostic approaches and targeted control strategies to reduce pre-weaning losses and improve overall herd health.

HHM-PP-67

PREVENTING THE TRANSMISSION OF PATHOGENS CAUSED BY MOBILE SENSORS IN PIG FARMING

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Background and Objectives

The use of mobile climate-recording systems (MCS) in pig farming is increasing, but moving devices between farms risks pathogen transmission.

Material and Methods

MCS were installed in the rearing unit of three farms (A, B, C) for two weeks and were sampled before cleaning (BC), after cleaning with sponges and tap water (AW) and after disinfection (AD) with 0,25g Didecyldimethylammoniumchlorid and 0,5 g Alkyl (C12-16)-Dimethylbenzylammoniumchlorid in 100 g solution. Total bacterial count (TBC), Enterococcus spp. (EC) and Streptococcus spp. content (StrC) in colony-forming units (CFU as $\log_{10}$)/sample, and the presence of PRRSV (ViroReal®Kit PRRSV Type 1&2, Ingenetix GmbH, Austria) were determined to evaluate the effectiveness of cleaning steps.

Results

The contamination of MCS varied between farms A (TBC = 6.55$\log_{10}$ CFU, EC = 4.72$\log_{10}$ CFU, StrC = 6.28$\log_{10}$ CFU, PRRSV-1 positive), B (TBC = 6.85$\log_{10}$ CFU, EC = 5.94$\log_{10}$ CFU,
StrC = 6.4$\log_{10}$ CFU, PRRSV-1 suspicious) and C (TBC = 5.93$\log_{10}$ CFU, EC = 4.70$\log_{10}$, StrC = 5.60$\log_{10}$ CFU, PRRSV negative). AW reduced the TBC (A = 99.23%, B = 90.39%, detection of bacteria not present before BC, C = 95.26%) and removed PRRSV-1. The combination of AW and AD reduced the BC-TBC by 99.97% (A), 99.98% (B) and 99.89% (C).

Discussion and Conclusion

Cleaning MCS with tap water reduced TBC. Additional disinfection improved hygiene. Despite using apparently new sponges, additional germs were transferred during the AW cleaning step of the B-sample and were eliminated by subsequent disinfection. Further studies should focus on other pathogens to guarantee the safe use of MCS.

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HHM-PP-68

EVALUATION OF THE EFFECTIVENESS OF A COMPLETE CLEANING AND DISINFECTION PROGRAM IN NURSERY FACILITIES

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Background and Objectives

Hygiene and biosecurity programs are essential for preventing disease in swine production, since ineffective cleaning and disinfection (C&D) can negatively affect animal health. Improving hygiene during the weaning phase is particularly relevant, as pigs are highly sensitive to infectious challenges. This study evaluated the effectiveness of a complete proposed C&D program in reducing morbidity, mortality and antimicrobial use in commercial nursery facilities.

Material and Methods

The study was conducted on four commercial farms and included 24,814 weaned pigs (32 batches, 28 days old). Two treatments were applied: the routine farm C&D protocol (Control); and the KVC program, which combined an enhanced C&D procedure with drinking water treatment. Products included Keno™ san (a penetrating and adhesive alkaline detergent), Virocid® (a quaternary ammonium, glutaraldehyde and isopropanol disinfectant), and CID 2000 (Peracetic acid and hydrogen peroxide). Animals were monitored during the nursery phase (5 weeks). On each farm, two Control batches were followed by six KVC batches. For each batch, the incidence of major pathologies, mortality and cause of death, and antibiotic treatments were recorded.

Results

Overall, the percentage of pigs requiring antibiotic treatment decreased from 6.40% to 4.07% with the KVC protocol ($P<0.05$). Mortality associated with meningitis decreased from 1.48% to 0.86% ($P<0.05$), and deaths due to lameness were reduced from 0.72% to 0.38% ($P<0.05$). Lameness was the most frequent pathology in the Control batches but the incidence decreased markedly with the new protocol (from 2.47% to 1.01%, $P<0.05$). Meningitis incidence also decreased ($P<0.05$). Digestive disorders increased in the KVC batches ($P<0.05$).

Discussion and Conclusion

The complete C&D program substantially reduced antimicrobial use and mortality in nursery pigs, particularly deaths associated with lameness and meningitis. These results demonstrate the value of improved hygiene protocols during a critical production stage, although the increase in digestive disorders requires further evaluation.

HHM-PP-69

FEEDING CHELATED ZINC, MANGANESE, COPPER AND SELENIUM AS SOLE SOURCES DURING GESTATION IMPROVES SOW CLAW HEALTH AND PRODUCTIVITY

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Background and Objectives

Chelated trace minerals are protected against antagonists in the intestine, absorbed at higher rates which results in improved hoof integrity, health and performance in comparison to inorganic sources. Yet, sow diets are typically supplemented with a combination of chelated and inorganic trace minerals. This study evaluated whether providing Zn, Mn, Cu and Se only in chelated form enhances sow health and productivity compared to a combination of inorganic and chelated trace minerals.

Material and Methods

A total of 414 gilts and sows were assigned by gestation batch, with batches randomly allocated to one of to two dietary treatments during gestation (six batches in total; three per treatment): a combination of chelated (Zinpro® Performance Minerals®) and inorganic trace minerals (Combi), or chelated minerals as the sole source (ZChel). Diets were fed from weaning to day 107 of gestation, after which all sows received the ZChel lactation diet. Sow body condition, reproductive performance and litter performance, claw lesion scores, farrowing performance, and health events were recorded. Data were analyzed using ANOVA or appropriate non-parametric tests.

Results

Sows receiving chelated minerals as the sole source (ZChel) lost less backfat during lactation (-1.6 vs -2.0 mm; $P<0.05$), had significantly ($P<0.05$) more total born (16.1 vs 14.8), born alive (14.3 vs 13.1) and weaned piglets (12.8 vs 11.8) compared to sows fed a combination of chelated and inorganic minerals (Combi). In ZChel sows the prevalence of heel-sole cracks and vertical wall cracks were decreased (10.2 vs 16.7%, 0.3 vs 2.1%, respectively; $P<0.05$), fewer antibiotic treatments were required (0.0 vs. 2.4%; $P<0.05$) and wean-to-estrus interval was shorter (5.8 vs 6.9 days; $P<0.05$) compared to sows on Combi.

Discussion and Conclusion

Using chelated minerals as the sole source during gestation improved claw health and litter performance, offering a practical nutritional strategy to reduce sow health problems and enhance productivity on commercial farms.

HHM-PP-70

NATIONAL PRRSV MONITORING AND CONTROL IN AUSTRIA

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Background and Objectives

Due to its huge economic impact, many countries have developed strategies to control/eliminate PRRSV. With Austrias geographic location, its role as transit country, national eradication of PRRSV seems unlikely, leading to the establishment of the program “PRRS stabilization” of the Austrian Animal Health Service (AHS). The voluntary program was launched in November 2019. The main goal is to minimize the spread of PRRSV and to improve the health of Austrian pigs. This is achieved by marketing piglets by PRRS-status. In this study, we evaluate the regional differences and the impact on antimicrobial use (AMU) of the “PRRS stabilization”-program.

Material and Methods

We used the data on the PRRS-status, which is assigned through an examination of blood samples. In unsuspicious and stable farms producing antibody(Ab)-negative piglets, the status is re-evaluated three times yearly. PRRS-positive farms must vaccinate their whole stock using the same MLV. Biosecurity measures must be implemented in all farms. Piglets from PRRS-positive farms are vaccinated and marketed separately from Ab-negative piglets. Further, yearly aggregated AMU data was analyzed.

Results

Current evaluation of the AHS-program showed that differences exist in the implementation of the program within different federal states. Looking at Upper Austria, one of the three major states in swine production, the most frequent PRRS-status from 2020 on, was “positive-sows and piglets vaccinated”, followed by “unsuspicious” (around 1/3). Evaluation of AMU data of Upper Austrian farms showed a positive effect of the AHS-program, since farms marketing PRRS-negative piglets had the lowest AMU from 2020 to 2023.

Discussion and Conclusion

Evaluation of the PRRS monitoring program will continue with longer time-series in the upcoming years. The focus of the evaluations will be on the implementation of the program by state, the PRRS-status-course over the past years, and a possible correlation between AMU and PRRS-status, as well as biosecurity in Austrian pig farms.

HHM-PP-71

RISK FACTORS IN PORCINE RESPIRATORY DISEASE COMPLEX: EXPERT KNOWLEDGE ELICITATION FOR AN APPROPRIATE DIAGNOSTIC APPROACH PROTOCOL

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Background and Objectives

Respiratory infections in pigs, collectively known as porcine respiratory disease complex (PRDC), are a major and costly concern in swine production. However, the role of specific structural and managerial risk factors to the spread of PRDC, is not completely well understood. In this study expert knowledge elicitation (EKE) was used to evaluate swine experts' perceptions of these risk factors.

Material and Methods

A modified Delphi method was used to interview 19 swine veterinarians from academia, diagnostic laboratories and farms. Risk perception was defined as the evaluation of a factor's inherent hazard and its potential adverse effect on the farm. The experts evaluated 15 factors, categorised into different levels, considering six major pathogens, including PRRSV, influenza A virus, pseudorabies virus, porcine circovirus 2 (PCV2), Mycoplasma hyopneumoniae and Actinobacillus pleuropneumoniae, as well as eight secondary pathogens (e.g. Pasteurella multocida). The factors were ranked on a scale from 0 (minimum) to 10 (maximum) based on estimated probability, severity, and duration of the adverse effect related to the specific hazard.

Results

The experts reached a consensus that internal environmental and management issues are critical and quantifiable risk factors for PRDC. Six factors achieved the highest recorded consensus score (9) for at least one pathogen: poor air quality (specifically high levels of NH_3, CO_2, and H_2S); high animal density; continuous flow pig systems; PRRS status (positive and unvaccinated or unknown); absence of vaccinations.

Discussion and Conclusion

A risk-based survey, weighted according to the main structural and managerial risk factors, represents a valuable tool for PRDC management. Furthermore, combining the survey with clinical data can guide the diagnostic protocol more efficiently, from sampling to test selection, helping to establish a diagnostic roadmap that considers all potential pathogens. EKE can provide scientific, evidence-based guidance for addressing health issues where scientific knowledge is limited.

HHM-PP-72

COMPARING THREE DIFFERENT DISINFECTANTS COMMONLY USED IN THE PIG STY

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Background and Objectives

Residual bacterial loads pose a threat to the health and welfare of pigs, and disinfection has a fundamental role in the cleaning regime in-between batches of animals. This study investigated the result from disinfection with three common disinfectants by quantification of total aerobic bacteria (TAB) and adenosine triphosphate (ATP).

Material and Methods

The three disinfectants used were 1. a quaternary ammonium compound (QAC), 2. a combination of QAC and glutaraldehyde, and 3. a potassium peroxymonosulfate-based disinfectant. Disinfection was carried out in three uniform farrowing units, following a cleaning protocol (manual scraping, soaking overnight and high-pressure wash with warm water). Sampling was performed within 90 minutes after washing and 48 h after disinfection, at two predetermined sampling sites per pen, A. in the corner on the slatted floor and B. in the middle of the solid floor, using a pre-moistened non-woven cloth (TAB analyses; logCFU/100cm2) and a cotton swab (ATP analyses; logRLU/100cm2).

Results

Bacterial reduction was significantly higher using disinfectant 3 on sampling sites A and B (1.3; 3.6; $p<0.05$). There was no significant difference in TAB between disinfectant 1 and 2 (0.6; 0.6). Sampling site B had a significantly higher bacterial reduction than A for all disinfectants (2.8-3.6; 0.6-1.3; $p<0.05$). For ATP, no significant differences were seen between disinfectant type, however, sampling site A had a significant ($p<0.05$) reduction (1.4) compared to sampling site B, which on average increased (-1.0) after disinfection.

Discussion and Conclusion

The significant result on site B for TAB shows that disinfectants play an important role in the cleaning procedure, and that a slatted floor and/or corners could be harder to clean properly. The significantly higher ATP reduction on site A is likely due to the overall lower start values on B. The different results highlight the potential difficulty to interpret ATP results in environments with high bacterial burden.

HHM-PP-73

AIR SAMPLING AS A TOOL FOR DETECTION AND SURVEILLANCE OF RESPIRATORY PATHOGENS IN PIG HERDS

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Background and Objectives

Airborne micro-organisms pose a significant threat to animal health, with major economic implications. Porcine Respiratory Disease Complex (PRDC), caused by pathogens like Mycoplasma hyopneumoniae (M.hyo), Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), and Swine Influenza A Virus (swIAV), is a growing global concern. Current diagnostics often target individual pathogens, missing the multifactorial nature of PRDC. Traditional diagnostics for PRDC, such as blood or respiratory tract sampling, are invasive, costly, and time-consuming. The sector is seeking a non-invasive, efficient alternative for early outbreak surveillance and pathogen monitoring.

Material and Methods

two commercially available air sampling devices, with different air sampling protocols, were evaluated for their ability to detect respiratory pathogens in pig pens under field conditions. Sampling was conducted across 80 compartments of nursery and fattening pigs on 20 pig farms. The tested air samplers included the Coriolis µ (Bertin Technologies) and the MD8 Airport (Sartorius). After air sampling, nucleic acids were extracted using the Indimag Pathogen Kit (Indical Bioscience) and analyzed by real-time PCR for M. hyo, PRRSV EU, PRRSV NA, and swIAV. Air sampling results were compared to conventional diagnostic methods, including nasal and tracheobronchial swabs, serum, and oral fluids, to evaluate their diagnostic performance.

Results

The first results demonstrated that both air samplers could capture the targeted respiratory pathogens. However, the detected concentrations varied according to the air sampler and used protocol.

Discussion and Conclusion

The results highlights the potential of air sampling as an alternative approach for detection of respiratory pathogens in swine herds. Further research will determine if this new approach could become a low- cost, non- invasive monitoring tool for improvement of early intervention and disease control in pig populations worldwide.

HHM-PP-75

FIELD-BASED APPROACH TO MITIGATE LOSSES IN FARMS INFECTED WITH MESOMYCOPLASMA (MYCOPLASMA) HYOPNEUMONIAE

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Background and Objectives

Mesomycoplasma hyopneumoniae (Mhyo) is a major driver of respiratory disease and economic loss in pig production. Commercial farms previously negative for Mhyo but become infected are raising concerns about performance deterioration. Breakdowns to Mhyo in previously negative commercial farms raise concerns about performance decline. This study evaluated whether deploying integrated management and preventive measures can preserve productivity and health under such conditions.

Material and Methods

A 2,800-sow commercial farm, PRRS-positive since July 2024, became Mhyo-positive in February 2025. Interventions included blanket vaccination of sows and gilts, piglet vaccination at 21 days (Porcilis® PCV M hyo ID), antimicrobial treatments (lincomycin for sows, tulathromycin for piglets), and strict McRebel protocols in farrowing. Monitoring included serology at 3,6,9,12,14 and 21 weeks of age (Mhyo IDEXX, PCV2 BioChek), PRRS PCR, slaughter lung lesion scoring, and performance indicators (mortality and feed conversion ratio(FCR)) across four periods: pre-PRRS, post-PRRS, post-Mhyo, and post-intervention.

Results

At 3 weeks, 95% of piglets were Mhyo ELISA-positive, indicating high maternal antibodies; at 6–9 weeks, 12% were positive, indicating residual MAD; older groups were negative, suggesting minimal pathogen contact. At 9 weeks, 91.6% were PCV2 ELISA-positive, consistent with post-vaccination seroconversion. PRRS PCR detected viremia between 3 and 12 weeks. Performance metrics stayed within historical ranges, and no overt respiratory signs appeared late in finishing. FCR remained stable (2.37). Mortality rose from 4.08% pre-PRRS and 5.90% pre-Mhyo to 5.96% post-Mhyo and 10.80% currently, attributed to lateral PRRS introduction. First slaughter checks revealed Mhyo-compatible lung lesions despite interventions (most batches pending evaluation at the abattoir in early 2026).

Discussion and Conclusion

Mhyo incursion in previously negative herds can impair productivity, especially with concurrent PRRS. The combined approach—vaccination, antimicrobials, and biosecurity—helped stabilize performance. Early detection and rapid implementation of integrated control measures are critical to mitigate losses. Further work should refine intervention timing and strategies for co-infection management.

HHM-PP-76

SURVEILLANCE OF MAJOR VIRAL PATHOGENS IN COMMERCIAL SWINE HERDS IN SERBIA

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Background and Objectives

Porcine reproductive and respiratory syndrome (PRRS), Pseudorabies and swine Influenza A viruses cause major economic losses and threaten swine health and productivity. This study examined seropositivity of these diseases over time, to determine their distribution, as a part of the regular disease control and surveillance programs.

Material and Methods

In total, 7656 blood samples were collected from sows, piglets, boars, gilts and fattening pigs on pig farms in West Bačka District, the Republic of Serbia, between January 2023 and November 2025. Blood samples were collected monthly, by puncturing jugular vein from different age and sex classes on a single occasion and tested for antibodies against PRRS, Pseudorabies and Influenza A using commercial INgezim ELISA kit (Gold Standard Diagnostics, Madrid, Spain) to determine the seroprevalence of these viruses. Chi-square test was used to evaluate the differences between classes seropositivity and sampling year, with the level of significance of $p<0.05$.

Results

The highest seropositivity of PRRS was observed in boars in 2023 (41.2%), while the lowest was in gilts in 2024 (0.1%). In following years, the seropositivity in boars deceased from 41.2% (2023) to 24.1% (2025), revealed a significant difference between 2023 and 2025 ($p<0.001$). Furthermore, Influenza A seropositivity was highest in fattening pigs in 2025 (51.8%) and lowest in gilts in 2025 (0.0%). Fattening pigs showed a significant increase ($p<0.05$) in seropositivity from 17.4% (2023) to 51.8% (2025). Nevertheless, seropositivity of Pseudorabies was highest in sows in 2024 (26.1%) and lowest in boars in 2025 (0.0%), with no observed differences between classes.

Discussion and Conclusion

The observed variations in seropositivity among animal classes highlight the everchanging nature of PRRS epidemiology. High and rising Influenza A seropositivity in fattening pigs underscores ongoing viral circulation. Therefore, it is necessary to have continuous surveillance and adequate health management to prevent major economic losses.

HHM-PP-77

DECODING PORCINE HEALTH VIA BLOOD TRANSCRIPTOMICS AND NOVEL PATHWAY ACTIVATION METHODS

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Background and Objectives

Farm-level health status has lasting effects on pig performance but remains difficult to quantify. Using a blood-based transcriptomic index of metabolic and physiological function, we compared growing pigs from higher- and low-health commercial farms in Spain.

Material and Methods

Blood samples were collected from 10 pigs per farm at 11 weeks of age. The low-health farm recently experienced a PRRS outbreak and was undergoing active Streptococcus suis and Actinobacillus infections, resulting in meningitis and pleuropneumonia. The higher-health farm was PRRS-positive but clinically stable. Whole-blood mRNA was used for transcriptomic analysis (BIOFRACTAL, Portugal). A topology-based pathway activation algorithm identified significantly altered pathways related to immune regulation, oxidative balance and nutrient metabolism. A standardized Metabolic Efficiency Index (MEI), derived from a large cohort of pig blood profiles, quantified the effects of pathway changes on metabolic efficiency and performance, ranging from –100 (compromised) to +100 (robust functional profile).

Results

Pigs from the low-health farm weighed an average of 23.4kg at sampling, compared with 33.9kg on the higher-health farm. Transcriptomic comparison showed a 23% reduction in MEI in low-health pigs (adj $P<0.05$). This reduction was driven by impaired gut–brain signalling (−41%), consistent with reduced feed-intake potential, and pronounced immune activation (−36%) with evidence of an active viral challenge. Additional disturbances were detected in nutrient metabolism and mitochondrial function (−20%). Evidence of redox stress (−19%) was also observed, with depletion of antioxidant systems and nutrient reserves.

Discussion and Conclusion

Blood transcriptomics revealed a substantial decline in metabolic efficiency associated with immune and metabolic disruption in low-health pigs. Alignment between molecular findings and growth performance indicates that this approach could support early field detection of emerging health and productivity risks.

HHM-PP-78

EFFECT OF APP ERADICATION ON GROWTH AT THE DELTA TEST STATION, NORWAY

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Background and Objectives

The Norwegian pig population has a favorable health status in relation to diseases that affect growth in finishers. PRRS and Mycoplasma hyopneumoniae are not present. Actinobacillus Pleuropnemoniae (APP), however, is widespread in conventional health herds. Delta Norway, a test station for breeding boars with detailed records of weight and feed intake, successfully implemented an APP eradication program in 2024. This provides us with data on ADG and FCR before and after APP eradication, thereby allowing us to quantify the economic impact of this disease during the growth period from 40 to 120 kg.

Material and Methods

At Delta, all pens feature advanced feeding stations with a weight scale and a chip reader for the ear tag. Every entry is recorded, including the weight and amount of feed consumed. The present data compares the FCR and ADG a full year before and after the eradication of APP, in total registrations from 7043 boars. This makes the prediction and standardization of ADG and FCR quite accurate. Since the genetic level of an animal will impact the ADG and FCR, this has been taken into account and corrected for.

Results

After APP eradication, we observe a decline in FCR, ranging from 1.69% for Duroc to 1.72% for Landrace. The ADG increased by 65.3 grams/day for Duroc and 45.1 grams/day for Landrace. Given a global marginal economic value (MEV) of €0.024 and €29.769 for respectively ADG and FCR, the margin of improvement per finisher will be between €2,18 and €2,64.

Discussion and Conclusion

Several factors can contribute to these results, however, it is reasonable to conclude that a substantial proportion of the increase in margin of improvement is due to the APP eradication.

HHM-PP-79

WEANING WEIGHT AND HEMOGLOBIN OUTCOMES IN PIGLETS AT WEANING FOLLOWING COMBINED TOLTRAZURIL–GLEPTOFERRON INJECTION FOR IRON DEFICIENCY ANEMIA AND CYSTOISOSPOROSIS CONTROL IN A PHILIPPINE COMMERCIAL FARM

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Background and Objectives

Cystoisosporosis and Iron Deficiency Anemia (IDA) are significant contributors to economic losses in piglet production worldwide. Cystoisospora suis infection causes intestinal damage and reduces average daily gain (ADG). IDA impairs growth and compromises immune function, further exacerbating piglet health and performance.

Material and Methods

The presented study took place on a 1200-sow commercial swine farm in the Philippines. Piglets were randomly assigned to two groups: Treatment group (T) (n= 311) was injected by combo product: toltrazuril (45 mg) and gleptoferron (200 mg), fixed dose 1,5 ml: (Forceris, Ceva Sante Animale France) and Control (C) (n= 350) by iron dextran (200 mg) and oral toltrazuril according to standard farm practice. At trial enrollment, random distribution of litters into the 2 groups (C, T) was performed and piglets were weight at 2-3 days of age (DOA) and at weaning (22 DOA). Blood for hemoglobin (Hb) evaluation was collected from 26 selected piglets from each group and respective litters according to the size: small, medium and large piglets/ litter. The % of anaemic piglets was calculated by considering Hb levels < 90 g/l as anemic, 90 g/l and < 110 g/l as suboptimal and 110 g/l as optimal. Statistics was done by unpaired t test by GraphPad Prism 10.2.3.

Results

At weaning, 46.1 % of piglets in the group T achieved optimal hemoglobin status at weaning, compared with 23% in the control group. Piglets in group T demonstrated a mean weaning weight advantage of 480 g over those in group C and a difference of 3 kilos per litter (expressed as median) (p= 0.167).

Discussion and Conclusion

The study demonstrated that the injectable formulation of TZL combined with GLP outperformed the conventional farm protocol in terms of piglet performance and iron status at weaning. This represents the first evidence from a fully automated industrial farm in the Philippines.

HHM-PP-80

SYSTEMATIC ON-FARM ASSESSMENT OF INJECTION SITES IN PIGLETS

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Background and Objectives

Needle injections in pigs are daily practice on pig farms. Most piglets receive various vaccinations and treatments at an early age, carried out by often changing farm staff. These procedures form the basis for good health prophylaxis. But injections, when done wrong, also possess the risk of negatively impacting animal health and wellbeing. Therefore, good veterinary practice guidelines have been established, on how to best perform injections in pigs. The presented data serves as a systematic on-farm assessment of injection sites during intramuscular vaccination procedures in German pig farms.

Material and Methods

In 10 German piglet-producing-farms, supervised by the same Vet, during a one-time farm visit, vaccination procedures were assessed. Injection sites in piglets (n total=1548; 50-134 per farm) were systematically scored by a scheme developed according to good veterinary practice in 5 categories (“acceptable”, “too far cranial/ caudal, ventral/ dorsal”).

Results

Overall, more than half of the injection sites were assessed “acceptable” (57.4%; n=888/1548). The greatest deviations occurred caudally (29.2%; n=452), followed by deviations dorsally (6.9%; n=107), cranially (3.7%; n=58) and ventrally (2.8%; n=43). Immense variations were observed between farms (“acceptable”: min:32.9%, max:57.4%; “too caudal”: min:3.0%, max:82.0%; “too dorsal”: min:1.0%, max:23.0%, “too cranial”: min:1.5%, max:53.9%; “too ventral”: min 0%, max:24.0%).

Discussion and Conclusion

Various anatomical structures can be hurt by injections when not done correctly. Especially, injections too caudal can lead to trauma of the forelimb. Further structures which can be harmed are e.g. salivary glands, vessels and nerves. Besides direct trauma, repeated use of needles can possibly lead to local inflammation or systemic transmission of pathogens. Data shows that consequent live-evaluation of on-farm-procedures is the basis for sustainable consultancy. Systematic and repeated training of farm employees and usage of intradermal injection tools can reduce the risk of injection trauma and consequently improve animal health and wellbeing.

HHM-PP-82

COMPARATIVE EVALUATION OF PERFORMANCE PARAMETERS OF PIGS VACCINATED WITH A PCV2A OR PCV2D BASED READY-TO-USE PCV2/M.HYO COMBINATION VACCINE

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Background and Objectives

The objective of this study was to evaluate the efficacy of 2 ready-to-use PCV2/M.hyo vaccines on growth performance.

Material and Methods

In a commercial Belgian farm positive for Mycoplasma hyopneumoniae (M.hyo) and PCV2, piglets were vaccinated at 4,5 weeks of age. 504 pigs vaccinated with CIRBLOC® M Hyo (2 ml, I.M.) (group A) and 505 pigs vaccinated with a PCV2a-based ready-to-use PCV2/M.hyo combination vaccine (2 ml, I.M.) (group B) were followed in the fattening phase. Each group had an equal number of females and males. Piglets of each treatment group were housed in similar conditions but kept separate. Pigs were weighed by pen at the beginning and end of the fattening phase, according to routine farm procedures. Feed consumption was measured by treatment group. Statistical analysis was performed using the statistical software SAS 9.4.

Results

Pigs in groups A and B had an average weight upon entry in the fattening unit of 32,46kg and 32,57kg respectively and an end weight of 127,58kg and 126,00kg. The average daily gain in group A was 16 g/day higher than in group B, respectively 897 g/day and 881 g/day. The observed weight differences were not significant (Wilcoxon rank sum test, p=0,21), probably associated with the fact that the pigs were weighed by pen and not individually. The feed conversion rate in group A was 0,011 lower than in group B (2,345 vs 2,356). In none of the treatment groups there was mortality caused by respiratory distress or wasting.

Discussion and Conclusion

In this study, vaccine A performed numerically better in ADG and feed conversion rate over the PCV2a-based ready-to-use PCV2/M.hyo combination vaccine.

HHM-PP-83

COMPARATIVE EVALUATION OF RESPIRATORY HEALTH OF PIGS VACCINATED WITH A PCV2A OR PCV2D BASED READY-TO-USE PCV2/M.HYO COMBINATION VACCINE

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Background and Objectives

The objective of this study was to compare the efficacy of 2 ready-to-use PCV2/M.hyo vaccines in terms of lung health.

Material and Methods

In a commercial Belgian farm positive for PCV2 and M.hyo, piglets were vaccinated at 4,5 weeks of age. 504 pigs vaccinated with CIRBLOC® M Hyo (2 ml, I.M.) (group A) and 505 pigs vaccinated with a PCV2a-based ready-to-use PCV2/M.hyo combination vaccine (2 ml, I.M.) (group B) were followed in the fattening phase. The presence and severity of bronchopneumonia was evaluated using the CLP methodology, a modified Madec scoring system. Scars, cranial pleurisy and dorsocaudal pleurisy were scored. Respiratory health was monitored during fattening (85-194 days of age) with SoundTalks which provides the animal respiratory health status (ReHS) value. A normal ReHS (>60) is represented by a green signal. Yellow and red alerts indicated a potential and high risk of a respiratory problem, equivalent to 40-59 and 0-39 ReHS respectively. The days were categorized as green, yellow and red days according to the daily ReHs.

Results

In group A, 86,6% of days were green, 9,7% were yellow and 3,7 % were red. In group B, 86,1% of days were green, 3,6% were yellow and 10,3% were red. In group A, 366 lungs and in group B 377 lungs were scored. The % of bronchopneumonia was 3,3% vs 5,0%; % of scars was 5,2% vs 8,5%; % of cranial pleurisy was 0,5% vs 0,8%; % of dorsocaudal pleurisy was 1,1% vs 3,4% in groups A and B respectively. No statistical differences were observed in lung lesion parameters.

Discussion and Conclusion

The pigs in group A had less days of coughing than pigs in group B. Group A had numerically less bronchopneumonic lungs, scars, cranial and dorsocaudal pleurisy compared to group B. Pigs in group A showed a better respiratory health in comparison to pigs in group B.

HHM-PP-84

CHROMIUM PROPIONATE SUPPLEMENTATION DURING THE PERIPARTAL AND LACTATION PERIOD AFFECTS BACKFAT TISSUE MOBILIZATION AND PIGLET PERFORMANCE

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Background and Objectives

By interacting with insulin, chromium (Cr) affects carbohydrate and lipid metabolism. Increased metabolic demand during peripartal period and lactation predispose hyperprolific sows to insulin resistance, excessive body reserve mobilization, and reduced feed intake. This study investigated the effects of chromium propionate (KemTRACE® Cr) supplementation on sow performance, backfat mobilization, and piglet growth.

Material and Methods

From day 108 of gestation until weaning, forty (n = 40) Topigs sows were divided into two treatments: (1) basal diet (Control, T1) and (2) basal diet supplemented with 200 µg Cr/kg feed as KemTRACE® Chromium 0.4% (T2). Sow feed consumption, body weight, and backfat thickness (P2) were measured. Piglet body weights at birth and weaning, growth, litter size and survival, were also recorded.

Results

Feed intake during the first days of lactation (day+1 to day+3: for T1 3.13kg daily; for T2 3.33kg daily) and during late gestation (day-7 to day-1: for T1 2.90kg daily; for T2 3.00kg daily) was increased by chromium supplementation ($P < 0.05$). Between late gestation (day 108) and early lactation (day+1), sows in T2 group had reduced backfat mobilization (0.30mm vs. 0.90mm; $P = 0.039$). At birth (1.60 vs. 1.43 kg; $P < 0.001$; T1: n=248; T2: n=242) and at weaning (8.60 vs. 8.13 kg; $P = 0.004$; T1: n=233; T2: n=229), the T2 group's individual piglet body weight was higher.

Discussion and Conclusion

Higher piglet weights at birth and weaning were the result of supplementing with 200 µg Cr/kg diet as chromium propionate, which enhanced sow feed intake and decreased early lactation fat mobilization. These findings are in line with the trace element's function in energy partitioning during the peripartum phase and indicate improved metabolic efficiency in supplemented sows. The study supports chromium's potential offers up-to-date, field-based data for its functional significance as a trace element in sow nutrition.

HHM-PP-85

THIS STUDY AIMS TO CHARACTERISE THE RISK OF AFRICAN SWINE FEVER (ASF) BEING INTRODUCED VIA MARITIME VESSELS AT THE PORT TERMINAL IN THE BíO-BíO REGION

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Background and Objectives

African swine fever (ASF) is a major disease in the pig industry.It is caused by a virulent virus that affects all pig species and almost 100% of those infected die.ASF is currently a top threat to global pig production and has huge socio-economic consequences for affected countries due to restrictions on international trade.This has made ASF a six-disease reporting requirement to the World Organisation for Animal Health. It has spread to more than 50 countries on four continents.The aim of this study is to analyse the factors that influence the introduction of African swine fever (ASF) at the port terminals of the Port of Talcahuano in the Bío-Bío Region according to the prevailing conditions of port activity.

Material and Methods

The data were obtained from the records of the Agricultural and Livestock Service (SAG), covering the terminals of Coronel, Lirquén, San Vicente and Talcahuano. A flow chart was developed in order to identify the key factors associated with the region's maritime routes, based on the information available.

Results

The analysis showed that the maritime routes with the highest levels of commercial connectivity, mainly from Latin America and the Caribbean (61.5%), East Asia (15.3%) and North America (13.5%), were the main factors. Container and bulk carriers, which make up 73.8% of total maritime traffic, can carry processed meat products, animal by-products and undeclared organic waste. These are important in the spread of the virus. Vessels from regions where the virus is present, such as sub-Saharan Africa, are also important. This shows that port terminals need to improve their surveillance and control measures.

Discussion and Conclusion

Just 1.9% of unloaded ships had waste management issues, e.g. missing lids, fastenings and airtight containers. Animal products made up 23.9% of the intercepted products, which could spread ASF.

HHM-PP-86

A PARTICIPATORY APPROACH TO IDENTIFY RELEVANT INDICATORS FOR THE ASSESSMENT OF PIG HEALTH

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Background and Objectives

Antimicrobials use (AMU) has largely decreased in pig farming in recent years in France, following sector's initiatives and regulations. To provide guidance in this minimal AMU while ensuring preserved pig health and welfare, we are currently developing a multicriteria method for monitoring these aspects. To our knowledge, if such methods exist for animal welfare, there is none that combines validated and operational indicators for the assessment of pig health in farms. A participatory approach was developed and implemented to determine which health indicators are relevant for this purpose.

Material and Methods

During a first meeting, a group of 4-5 experts were asked to score pig health indicators - coming from a literature search - on perceived feasibility, reliability, specificity and sensitivity. Then, during a second meeting, the results were discussed until an agreement is reached on the most relevant indicators for assessing pig health, that will be kept for the monitoring protocol later on. Discussions were facilitated by the supervisor. This process was repeated for every biological system (e.g. respiratory, digestive).

Results

For the first session on respiratory health, based on the scoring task results and the discussions, experts selected 52 indicators (out of 93 initially proposed) they perceived relevant. Indicators were categorized as clinical signs (e.g. coughing), biological analysis (e.g. lung histology), slaughterhouse data (e.g. carcass condemnations), necropsy data (e.g. pneumonia), performance data (e.g. daily weight gain) or environmental data (e.g. humidity). Our proposed framework successfully helped the experts to reach an agreement. Indicators were also deeply characterized through experts' rationales.

Discussion and Conclusion

Our study provides a participative and iterative framework to identify and characterize pig health indicators through expert elicitation. Thereafter, their most adapted measure method will be identified through a similar approach. Selected indicators will be then integrated and aggregated into a protocol for monitoring pig health, welfare and AMU on farms.

HHM-PP-88

FROM MOVEMENTS TO RISK: HOW DIGITAL TRACKING RESHAPES BIOSECURITY AND PRRSV TRANSMISSION DYNAMICS

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Background and Objectives

PRRSV remains a major threat to swine production, with the emergence of the hypervirulent recombinants strains like “Rosalía” intensifying clinical and economic impacts in Spain. Human-mediated movements are a dominant pathway for indirect transmission, yet behavioural compliance with biosecurity protocols is challenging to monitor objectively. This study aimed to (i) quantify internal PRRSV transmission risk associated with personnel flows using BioRISK® Internal and (ii) evaluate how continuous digital monitoring can modify worker behaviour and reduce epidemiological risk.

Material and Methods

From April to September 2025, seven workers were tracked across ten production zones using 33 receiver plates and beacon-based localisation. Directed networks (zone□zone) were constructed in R (igraph) to estimate edge-specific risk, epidemiological bridges, and worker-level indices. The system provided real-time feedback and periodic risk reports to farm management, enabling targeted coaching focused on high-risk workers and zones.

Results

Digital tracking revealed that 28.3% of movements were unsafe, largely concentrated in fattening□fattening and fattening□gestation routes, confirming entrenched behavioural patterns incompatible with optimal biosecurity. Risk was highly individualised: two workers accounted for >55% of the epidemiological burden, demonstrating the potential impact of behavioural outliers. Coaching based on digital evidence prompted measurable behavioural modifications, including reduced inter-zone transitions, greater adherence to unidirectional flows, and improved use of dressing-room protocols. Technology thus functioned as both a diagnostic and behavioural-modulation tool, consistent with evidence that digital nudging enhances compliance in farm biosecurity systems.

Discussion and Conclusion

BioRISK® Internal enabled objective behavioural measurement, identification of “superspreader-like” workers, and data-driven coaching that altered movement patterns and reduced internal transmission risk. Integrating behavioural analytics with farm biosecurity design offers a scalable pathway to sustainably reducing PRRSV pressure.

HHM-PP-90

MICROBIAL COMMUNITY SHIFTS ASSOCIATED WITH PRDC VACCINATION AND CHALLENGE IN PIGS

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV), swine influenza virus (SIV), porcine circovirus type 2 (PCV2), and Mycoplasma hyopneumoniae are major viral and bacterial pathogens involved in porcine respiratory disease complex (PRDC), a significant health and economic burden in commercial pig farming. This study aimed to evaluate the efficacy of PRDC combination vaccines and investigate how vaccination modulate the gut microbiome of pigs. We compared the gut microbiota of four groups: (-)CTL (untreated controls), (+)CTL (PRDC-challenged controls), Vac (vaccinated-only), and Vac-Chal (vaccinated and challenged).

Material and Methods

Wild-type PCV2b and Mycoplasma hyopneumoniae (Mhp) strains were isolated and quantified to challenge specific pathogen-free (SPF) pigs and assess PRDC combination vaccine efficacy. Pigs were randomly assigned to four groups: (-)CTL (healthy controls), (+)CTL (challenged-only), Vac (vaccinated-only), and Vac-Chal (vaccinated and challenged). Pigs were vaccinatedat 3 weeks of age and challenged at 7 weeks of age. Colon contents were collected at necropsy at 11 weeks of age. Fecal DNA was extracted, and the V3–V4 region of the 16S rRNA gene was sequenced using next-generation sequencing.

Results

Vaccination markedly altered the composition and stability of the gut microbiome compared with non-vaccinated, challenged pigs. In particular, the Vac-Chal group showed reduced relative abundance of potentially pathogenic taxa such as Methanobacteriaceae and increased diversity and relative abundance of beneficial commensals, including Firmicutes-associated taxa, compared with the (+)CTL group.

Discussion and Conclusion

These findings suggest that PRDC vaccination not only protects against respiratory pathogens but also beneficially modulates the gut microbiota, which may contribute to improved health, resilience and productivity in pigs.

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HHM-PP-91

CASE REPORT: IMPACT OF MASS SOW VACCINATION AGAINST MYCOPLASMA HYOPNEUMONIAE ON PIGLET COLONIZATION AT WEANING

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Background and Objectives

This field case reported in a commercial herd of 1,500 sows that had previously experienced a Porcine Respiratory Disease Complex (PRDC) outbreak.
For the past two years, all farms supplied by the same gilt multiplier—including the investigated herd—received gilts certified free of M. hyopneumoniae based on quarterly PCR monitoring.
However, differences in gilt and sow vaccination strategies generated contrasting outcomes among the recipient farms.
The negative control farm, which did **not** vaccinate its breeding herd (vaccination discontinued 18 months ago), produced highly PCR-positive piglets requiring doxycycline treatment during the post-weaning period.
In contrast, 4 Farrow to Finish farms that had maintained sow mass vaccination for several years consistently produced PCR-negative piglets and did not require antibiotic medication aginst respiratory diseases.
The objective was to assess whether the re-introduction of the vaccination in sows could reduce the transmission of Mycoplasma hyopneumoniae (M. hyo) to piglets.

Material and Methods

The vaccination program used **Ingelvac Mycoflex®** for both sows and piglets according to the manufacturer's instructions.
After reintroducing sow vaccination, bronchoalveolar samples were collected from 30 piglets at weaning with 4 weeks of age and 4 months after vaccination and compared with samples from other vaccinated herds supplied by the same multiplier. PCR testing was performed to detect the presence of M. hyo.

Results

After reintroducing mycoplasma mass sow vaccinationin the studied herd, all bronchoalveolar samples from 4-week-old piglets tested PCR-negative for M. hyopneumoniae, clinical respiratory signs disappeared, and antibiotic treatments are no longer necessary .
These findings confirm that sow vaccination could effectively prevents piglet colonization at weaning, reducing the prevalence of PCR-positive animals.

Discussion and Conclusion

These results confirm that mass sow vaccination is an effective strategy to prevent early M. hyopneumoniae colonization and reduce antimicrobial use in swine production systems.
Keywords: swine, Mycoplasma hyopneumoniae, sow vaccination, piglet colonization, antimicrobial reduction.

HHM-PP-92

COMPARISON OF PRODUCTION PARAMETERS IN GROUPS VACCINATED AGAINST ILEITIS VIA ORAL AND INTRAMUSCULAR ROUTES. A FIELD STUDY

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Background and Objectives

Ileitis (caused by Lawsonia intracellularis) exerts a substantial influence on production parameters, thereby significantly affecting economic performance indicators. Due to the emphasis on responsible antibiotic use, vaccination of piglets has become a key strategy in controlling the damage caused by this disease. The objective of this study was to compare the effects of oral- and intramuscular vaccination on production performance and economic parameters in a Hungarian swine herd.

Material and Methods

The study was conducted on a commercial farrow-to-finish pig farm housing with 600 sows.Piglets were allocated into two experimental groups:Group A (oral vaccination,): 5,636 piglets, with 26.61kg average initial body weightGroup B (intramuscular vaccination, IM with Porcilis Lawsonia IM): 5,425 piglets, with 26.55kg average initial body weight.Both vaccination protocols were administered strictly in accordance with the manufacturer's instructions. Both groups were under the same environmental and nutritional conditions throughout the trial with the same length of the fattening phase.The following production parameters were recorded:Average Daily Gain (ADG)Feed Conversion Ratio (FCR)Mortality rate (MR)Culling rate (CR)Market weight (MW)

Results

We observed significant improvements across all measured parameters in the **Group B (IM)**: ADG increased by 21 g/day (from 873 to 894), while FCR improved by 0.03 points (from 2.62 to 2.59), indicating more efficient feed utilization. MR decreased by 1.9% points (from 3.5 to 1.6) CR decreased by 0.5% points (from 1.4 to 0.9). These performance gains translated into an average market weight increase of 3.39 kg/pig (from 107.32 to 110.71), contributing to enhanced higher profitability.

Discussion and Conclusion

Under the conditions of this study, we highlighted the effectiveness of intramuscular vaccination, as well as the fact that it resulted in an extra profit of €5.1 per pig compared to the group treated with oral vaccine.

HHM-PP-93

PROTECK IMPROVED SOW PRODUCTIVITY UNDER ITALIAN FIELD CONDITIONS

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Background and Objectives

A bioactive mineral-based feed additive (BMF) is a mined mineral from a unique location that has demonstrated a positive impact on the porcine microbiota. Feeding BMF to sows throughout gestation and lactation resulted in 0.7 extra piglets weaned per litter combined with an increased glutathione peroxidase activity (GPx) in blood serum from sows (d114 of gestation). This improved oxidative stress status may contribute to better piglet quality. The objective was to determine the effect of BMF on litter performance and reactive oxygen metabolites (ROM) as an indicator of GPx activity.

Material and Methods

A 1400-sow Italian farrow-to-finish farm (TN70) was enrolled in the longitudinal study. BMF (Proteck; Elanco AH, Indianapolis, IN, USA) was fed at 2 kg per tonne of feed. Monthly blood samples (n = 220 in total) were collected from sows in late gestation (d114) for d-ROM analysis. Sow reproductive performance parameters were recorded throughout the study. Data were analyzed using JMP 17.0 at a significance level of 0.05.

Results

d-ROM levels were significantly ($P < 0.05$) reduced from 36.16 mg H_2O_2/dL (n = 145) in the Control group to 23.30 mg H_2O_2/dL (n = 75) in the BMF group. Third parity sows had an extra 0.6 piglets per litter ($P < 0.05$). Number of stillborn piglets/litter significantly ($P < 0.05$) reduced by 0.133, and number of mummified piglets/litter significantly ($P < 0.05$) reduced by 0.16 in the BMF group. In the BMF fed group, an additional 0.245 piglets were weaned per litter ($P < 0.01$).

Discussion and Conclusion

The present longitudinal field study demonstrated that feeding BMF to sows during the entire production cycle resulted in an increase of 0.245 piglets per sow per litter or 0.588 piglets per sow per year. Feeding the BMF decreased d-ROM by 35% resulting in overall decreased oxidative stress level within the sows. Cod: IMM-PP-01

IMM-PP-01

EVALUATION OF LFBK CELL LINE AS A SCALABLE PLATFORM FOR ASFV REPLICATION AND INNATE IMMUNE SIGNALING STUDY

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Background and Objectives

African swine fever (ASF) causes high mortality in swine, yet lacks a globally effective vaccine. Current vaccine development relies on primary porcine alveolar macrophages (PAMs), which are restricted by ethical constraints, batch variability, and poor scalability. This study evaluated the LFBK cell line as a continuous, scalable in vitro model for efficient African swine fever virus (ASFV) replication and innate immune signaling analysis.

Material and Methods

ASFV (strain Korea/Pig/Paju1/2019) propagation was compared between PAMs and LFBK cells. Viral replication was quantified using HAD_{50} (PAMs), $TCID_{50}$ (LFBKs), and qRT-PCR for p72 gene copies. Infection rates were visualized via immunofluorescence assay (IFA) targeting the p72 protein. Innate immune responses were assessed by quantifying mRNA levels of interferon-related genes and utilizing luciferase reporter assays (IFN-®, ISRE promoters). Immunoblotting was performed to analyze phosphorylation events in the IRF3, STAT1, and NF-┤B signaling pathways.

Results

ASFV replicated efficiently in LFBK cells, with DNA copies increasing to 6.5–7.5 Log_{10} (lysates) by 72 hours post-infection. LFBK cells demonstrated significantly higher susceptibility, with 37.8% ± 12.6% p72-positive cells compared to 6.2% ± 1.2% in PAMs. While cell viability remained stable at 24 hpi, it declined to 63% by 72 hpi. Infection induced robust type I interferon responses, including elevated IFN-®/ISRE promoter activity and phosphorylation of IRF3 and STAT1. However, p65 (NF-┤B) phosphorylation was absent, mirroring authentic ASFV immune evasion observed in natural hosts.

Discussion and Conclusion

LFBK cells support productive ASFV replication and activate type I interferon pathways while retaining specific viral immunomodulatory phenotypes. The significantly higher infection rate compared to PAMs highlights LFBK as a superior, uniform platform. These findings demonstrate that LFBK is a suitable, ethically compliant model for studying ASFV pathogenesis and represents a vital tool for the scalable production of future live attenuated vaccines.

IMM-PP-02

IMMUNOGENICITY AND EFFICACY OF A MYCOPLASMA HYOPNEUMONIAE / PORCINE CIRCOVIRUS TYPE 2 COMBINATION VACCINE AGAINST EXPERIMENTAL MYCOPLASMA HYOPNEUMONIAE INFECTION IN PIGS

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Background and Objectives

The combination vaccine is an important control measure against infections with Mycoplasma hyopneumoniae (M. hyopneumoniae), the primary pathogen of enzootic pneumonia in pigs, which induces humoral and cellular immune responses against M. hyopneumoniae. This study investigated local and systemic humoral and cell-mediated immune responses and the efficacy upon vaccination of piglets with a combination vaccine containing inactivated M. hyopneumoniae and porcine circovirus 2d (Cirbloc® M. Hyo, Ceva), followed by experimental M. hyopneumoniae infection.

Material and Methods

Forty-five piglets were assigned to control (n=20), vaccine (n=20), and sentinel groups (n=5). Vaccination was performed in vaccine group on D0, and challenge infection was conducted in the control and vaccine groups on D21. The sentinel group received Friis medium. Eight pigs of the vaccine and control groups were euthanized on D35, the remaining pigs on D49. Blood, lung tissue, bronchoalveolar lavage fluid (BALF), and bronchial lymph nodes were collected at different time points to evaluate antibody and cytokine responses with ELISA, vaccine-specific T cell responses with flow cytometry, clinical signs, and M. hyopneumoniae DNA load by qPCR.

Results

The sentinel animals remained negative throughout the study. The vaccine group exhibited seroconversion on D21 and D35, with elevated levels of M. hyopneumoniae-specific IgA and IgG in BALF on D35. The vaccine group showed activation of IFN-©+/TNF-◊+ CD4 in blood on D7, which remained elevated through D21. The control group demonstrated an increased activation of IFN-©+ $CD4^{+}CD8◊^{-}$ T cells in blood on D35. The concentrations of IL-10, IL-1®, TNF-◊, CXCL-8, and IL-17A in BALF of the control group were higher on D49, correlating with higher M. hyopneumoniae DNA loads. Clinical signs and lung lesions were less severe in vaccinated pigs.

Discussion and Conclusion

The combination vaccine elicited M. hyopneumoniae–specific humoral and cellular responses in blood, underscoring its protective efficacy.

IMM-PP-03

PCV2-SPECIFIC T CELL RESPONSE IN PIGLETS VACCINATED WITH MHYOSPHERE® PCV ID

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Background and Objectives

Vaccines generally stimulate both humoral and cellular immune responses against pathogens. However, antibody levels do not always correlate with protection and may therefore provide an incomplete measure of vaccine efficacy. Assessing the cellular immune response induced by vaccination offers a complementary approach to evaluating immunogenicity. This study aimed to analyse PCV2-specific T cell responses in peripheral blood mononuclear cells (PBMCs) from pigs vaccinated with MHYOSPHERE® PCV ID.

Material and Methods

The study included two groups of 6-week-old piglets (n = 8/group), one vaccinated and one non-vaccinated control. Two blood samples were obtained at 14 and 21 days post-vaccination. PBMCs were isolated from heparinized-blood samples by density-gradient centrifugation using Histopaque 1077. PBMCs in complete culture media were then stimulated with three different concentrations of purified PCV2 virus-like particles (VLPs) to quantify Interferon (IFN) gamma producing cells by ELISpot.

Results

At 14 days post-vaccination, vaccinated animals showed significantly higher levels of IFN gamma secreting cells when stimulated with the three PCV2 VLP concentrations compared with the non-vaccinated animals. At day 21 post-vaccination these differences were also observed with the two highest PCV2 VLP concentrations.

Discussion and Conclusion

Vaccinated animals exhibited a cell-mediated immune response, as detected by the ELISpot assay, which measured PCV2-specific IFN gamma secreting cells following stimulation with PCV2 VLPs. The PCV2-specific IFN gamma response may serve as a useful tool for assessing the cellular immune response at the group level.

IMM-PP-04

EVALUATION OF THE EFFECT OF TWO VACCINATION STRATEGIES IN THE REDUCTION OF FREQUENCY AND LOAD OF PATHOGENS

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Background and Objectives

Porcine reproductive and respiratory syndrome virus, porcine circovirus type 2, and Mycoplasma hyopneumoniae affect swine health and performance. Effective control depends on vaccine efficacy but also on safe administration, as needle reuse can promote pathogen iatrogenic transmission, tissue damage, abscesses, and carcass defects. Needle-free devices prevent these issues, while improving welfare and safety.This study evaluates the effect of intradermal needle-free vaccination strategy (ID-NFID) on piglet performance and pathogen transmission compared with intramuscular needle-syringe vaccination strategy (IM-NS).

Material and Methods

Two groups were evaluated across three consecutive batches (n = 736 piglets/group). Group A (ID-NFID) received MHYOSPHERE® PCV and UNISTRAIN® PRRS concurrently at 3 weeks-of-age (woa) via HIPRADERMIC® device. Group B (IM-NS) received UNISTRAIN® PRRS, Ingelvac CircoFLEX®, and HYOGEN® administered by IM-NS at 3 woa. Mortality and average daily gain (ADWG) were assessed from weaning to the end of the nursery period (4 to 9 woa). Nasal swabs (n = 30 batch/group) were collected at 3, 6, and 8 woa and were analyzed using a QuantStudio 7 chip allowing for simultaneous detection of 26 pig pathogens.

Results

Group A showed a higher ADWG (0.354 vs. 0.323 kg/day; $p = 0.0013$) and lower mortality (0.95% vs. 2.31%; $p = 0.0479$) compared to the group B. RT-PCR analysis revealed lower positivity rates and higher mean Cq values for several respiratory pathogens (Actinobacillus pleuropneumoniae, Parvovirus 2, Mycoplasma hyorhinis, Porcine cytomegalovirus, and Swine orthopneumovirus) in group A ($p < 0.05$).

Discussion and Conclusion

ID-NFID strategy maintained productive performance and was associated with reduced pathogen circulation compared with IM-NS strategy. However, some differences may reflect the type of vaccines administered, as these target primary agents of the porcine respiratory disease complex and may indirectly affect secondary respiratory infections or overall vaccine efficacy. Nevertheless, ID-NFID strategy appears to be an effective approach to improve swine health and reduce respiratory coinfections.

IMM-PP-05

ENHANCED PCV2 CONTROL WITH A NOVEL PCV2D–MYCOPLASMA HYOPNEUMONIAE VACCINE COMPARED TO AN INTRADERMAL COMBINATION VACCINE IN EXPERIMENTALLY CHALLENGED PIGLETS

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Background and Objectives

Porcine circovirus type 2 (PCV2) is a major pathogen driving productivity losses in modern swine systems. Effective vaccines must limit viraemia, shedding, and viral persistence in lymphoid tissues. This study compared PCV2 protection induced by Cirbloc® M Hyo (CMH) and an intradermal PCV2/Mhyo vaccine (Vaccine A), focusing on viraemia, rectal shedding, and viral loads in lymph nodes (LN).

Material and Methods

Piglets from a high-health herd were vaccinated at three weeks of age with either CMH or Vaccine A. At eight weeks, pigs were challenged with PCV2d. Post-challenge sampling measured PCV2 viraemia and rectal shedding (AUC). At necropsy, PCV2 DNA (log10 copies/ʃL) was quantified in mesenteric, mediastinal, and inguinal LN. Only PCV2-related endpoints were evaluated in this analysis.

Results

CMH produced markedly lower viraemia compared with Vaccine A (AUC: 0,000 vs 1,823 log 10 copy / ʃl x week). Rectal shedding was also reduced in the CMH group (AUC: 0,000 vs 3,976 log 10 copy / ʃl x week). LN viral loads were consistently lower following CMH vaccination: Mesenteric LN: CMH 0,73, Vaccine A 2,02; Mediastinal LN: CMH 0,93, Vaccine A 2,97; Inguinal LN: CMH 0,56, Vaccine A 2,03. Across all PCV2 parameters—viraemia, shedding, and lymphoid tissue burden—CMH demonstrated numerically up to significantly (for tissue loads $p<0.05$) superior control.

Discussion and Conclusion

Although needle-free intradermal vaccination offers practical advantages in pig handling and operator safety, its performance in this study was inferior to that of Cirbloc® M Hyo. CMH provided more robust suppression of PCV2 replication, reflected in substantially reduced viraemia, shedding, and LN viral loads. These results support CMH as the more effective choice for controlling PCV2 infection under experimental challenge conditions.

IMM-PP-06

AUTOGENOUS VACCINE AGAINST MYCOPLASMA HYORHINIS AND MYCOPLASMA HYOSYNOVIAE: A TOOL FOR JOINT DISEASE CONTROL.

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Background and Objectives

Mycoplasma hyorhinis (MHR) and Mycoplasma hyosynoviae (MHS) cause arthritis in pigs, impairing welfare and farm productivity. In absence of commercial vaccines in Europe, control depends on outbreak management and antibiotics, but antimicrobial treatment fosters the development of resistance. We evaluated the clinical efficacy of a bivalent inactivated autogenous vaccine against MHR and MHS and its effect on antimicrobial use (AMU).

Material and Methods

A vaccination trial was carried out on a farrow-to-finish farm with 350 sows, where in November 2022 lameness had affected around 20% of pigs per batch across preweaning, weaning and early finishing phases. Laboratory tests confirmed MHR and MHS as etiologic agents. Farm-specific isolates were inactivated to produce the vaccine. Gestating sows and their offspring were vaccinated beginning August 2024; two successive batches were compared to non-vaccinated controls. Mortality, lameness and AMU (especially Tiamulin) were recorded.

Results

In the first batch (699 piglets: 607 vaccinated, 92 control) preweaning mortality dropped from 16.3% to 6.92%, and weaning mortality from 19.48% to 5.31%. Lameness incidence decreased from 9.78% to 1.81% in the preweaning period and from 10.39% to 1.77% at weaning. In the second batch (520 piglets: 455 vaccinated, 65 controls), despite a concurrent PRRS outbreak that increased overall mortality, vaccinated piglets displayed much lower lameness rates than controls, both before (1.32% Vs 18,46%) and after (1.08% Vs 8%) weaning. After integrating vaccination into routine management, overall AMU fell from 5.9 DDDAit (Defined Daily Dose Animal for Italy) in 2023 to 2.2 by late 2025; in particular Tiamulin consumption declined from 1.0 to 0.11 DDDAit.

Discussion and Conclusion

The bivalent inactivated autogenous vaccine delivered significant clinical benefits, reducing both lameness and mortality. Moreover, there was a marked reduction in antibiotic consumption, especially pleuromutilins. These results underscore the vaccine's potential as a strategic tool for controlling joint disease and promoting antimicrobial stewardship in swine production.

IMM-PP-07

EFFECTS ON ACUTE PHASE PROTEINS IN PIGLETS OF TWO DIFFERENT PCV-2 AND MYCOPLASMA HYOPNEUMONIAE VACCINATION PROTOCOLS

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Background and Objectives

The aim of this study was to evaluate the response of wean piglets to vaccination with two different PCV-2 and Mycoplasma hyopneumoniae vaccine combinations based on Hp, CRP and rectal temperature.

Material and Methods

In total, 40 commercial piglets from the same flow were divided into two groups and vaccinated intramuscularly at 28 days of age. The first group (A, n=20) received a fresh mixture of CircoFLEX® and MycoFLEX® in a single injection of 2 ml (FLEXcombo®; Boehringer Ingelheim). The second group (B, n=20) was vaccinated with 2 ml of a ready-to-use (RTU) product, Cirbloc Mhyo® (Ceva Santé Animale). Blood samples were taken just before vaccination and at 24h and 48h after vaccination. Rectal temperatures were taken just before vaccination and at 6 h after vaccination.

Results

Both protocols increased CRP and HP serum concentration in comparison to the basal level of the respective group. This increase was significantly higher ($p<0.05$) in group B at 24 hours post-vaccination. Hp and CRP concentrations were significantly higher in group B compared to group A. The average rectal temperature in pigs vaccinated with the treatment A increased slightly but not significantly (+0.4 ºC). The average rectal temperature of group B presented a significant increase ($p<0.05$) in the next 6 hours after vaccination (+1.3ºC above basal levels). The rectal temperature of piglets from the group B was significantly higher ($p<0.05$) than those from the group A.

Discussion and Conclusion

The release of APPs was significantly higher in piglets vaccinated with the protocol B (Cirbloc Mhyo®). Furthermore, a significant increase of rectal temperature was observed in group B pigs. As described in other studies[6], vaccination with FLEXcombo® has a minor negative effect on well-being parameters and induces less stress, compared to other vaccines such us RTUs, which is important for intestine integrity and growth performance during the nursery period.

IMM-PP-08

REDUCTION IN THE INCIDENCE OF EAR NECROSIS OBSERVED IN PIGS VACCINATED WITH VEPURED® UNDER FIELD CONDITIONS

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Background and Objectives

Porcine ear necrosis (PEN) is considered a welfare problem in the modern swine industry and has multifactorial causes. A mechanism that might be involved is impaired blood supply to the ear tips. Given the ability of Vtx2e (Verotoxin 2e) to cause degenerative angiopathy, it has been suggested that infections with Vtx2e producing Escherichia coli strains (VTEC) might be a predisposing condition. This study aimed to describe two cases of PEN reduction after Vtx2e vaccination.

Material and Methods

Field studies vaccinating piglets with Vepured® versus control animals were performed in South Africa (Farm A) and Belgium (Farm B). The presence of VTEC was demonstrated in both farms by Vtx2e-gene RT-PCR (VeroCheck®), but no clinical oedema disease (OD) was reported. Vaccinated (Farm A, n=989; Farm B, n=509) and non-vaccinated animals (Farm A, n=1027; Farm B, n=508) were scored for incidence of PEN by blinded observers in the nursery stage. Average daily gain (ADG), exit weights, and mortality in the fattening stage were also recorded. A logistics regression model was used to determine statistical significance.

Results

In Farm A, the incidence of PEN in the vaccinated groups was significantly lower (31,6%) than in the control groups (71,7%) (p=0,001). Similarly, in Farm B the vaccinated group had significantly less PEN incidence (15,7%) compared to the control group (36,1%) (p<0,001). Also in Farm B, vaccinated animals displayed a significantly higher ADG than non-vaccinated animals (487g/day compared to 464g/day) (p=0,0014). In the fattening phase, vaccinated groups in Farm A had significantly lower mortality (2,9%) than non-vaccinated groups (5,3%) (p=0,012).

Discussion and Conclusion

Although further research is necessary to unravel the underlying mechanism, vaccination against Vtx2e seems to reduce the incidence of PEN under certain field conditions. The challenge in practice, however, is to predict which farms will benefit from OD vaccination to reduce it, given the multifactorial nature of the problem.

IMM-PP-09

PCV2D BASED VACCINE PERFORMANCE UNDER FIELD CONDITIONS IN BRAZILIAN FARMS: SEROCONVERSION AND VIREMIA

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Background and Objectives

Even though the outstanding results given by PCV-2 vaccination of piglets, immunizing this specific age group of animals has been shown to change the dynamic of infection of this virus. Continuous viral mutations, the emergence and predominance of PCV2d genotype, has become evident in recent years. This study aimed to evaluate PCV2 protection by comparing two PCV2/Mhyo RTU vaccination protocols, under field conditions in a herd with confirmed PCV2d circulation.

Material and Methods

The field trial started on a commercial farm located in Paraná State (Brazil) with a previous confirmed history of PCV2b+d circulation. A total of 1050 Piglets (28 DOA) were allocated into two treatment groups: Group1: PCV2d/Mhyo vaccine RTU- CIRBLOC® M Hyo, Ceva Animal Health, and RTU PCV2a,b + M. hyo. Both groups were maintained under identical housing and environmental conditions during the experimental period. Serology (ELISA BioChek®) and qPCR analyses were performed at 3, 6, 9, 12, 16, and 22 weeks to assess antibody response and viremia levels. The data were analyzed using t-test.

Results

Animals from Group 1 showed a significantly stronger serological response against PCV2 especially five weeks post vaccination when compared with the other group (S/P 2,88 and 0,70, respectively, $p<0.05$). No viral load was detected in both groups during the trial.

Discussion and Conclusion

The serological response to vaccination, especially in herds with low infection challenge, can provide important insight into the actual effectiveness of the vaccination program. CIRBLOC® M Hyo displayed higher seroconversion rates which suggests a stronger potency compared with a PCV2a/b-based vaccine.

IMM-PP-10

PCV3 PRESENCE AND ORF2 SEQUENCE HOMOLOGY IN CANADA FROM JANUARY 2021 TO JULY 2025

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Background and Objectives

Porcine circovirus type 3 (PCV3) has been detected globally, and its role in porcine circovirus–associated disease remains under investigation. Continuous genomic surveillance is essential to detect emergent divergent strains that could affect disease presentation or vaccine performance. Our objectives were to characterize PCV3 detection and ORF2 sequence homology among Canadian field samples collected between January 2021 - July 2025, and to evaluate temporal stability and sequence similarity to an available PCV3 ORF2–based vaccine.

Material and Methods

Diagnostic laboratory data and sequence records from commercial swine submissions across five provinces were reviewed. PCV3 was identified by PCR from clinical and surveillance samples. ORF2 (capsid) gene was sequenced using Sanger or next-generation methods, as available. Consensus ORF2 sequences were assembled and aligned to calculate pairwise nucleotide and amino-acid identities across samples and versus the PCV3 Sequivity® vaccine ORF2 reference. Temporal and geographic variation were assessed, including phylogenetic clustering.

Results

PCV3 was detected in submissions from all five Canadian provinces. ORF2 consensus sequences demonstrated high homology: mean nucleotide identity among field sequences was 98.43%, with similar pairwise amino-acid conservation. Comparison to the PCV3 vaccine ORF2 sequence revealed 98.06% nucleotide identity, with no consistent or regionally restricted amino-acid substitutions suggestive of antigenic drift, and no progressive genetic shift within ORF2 was observed over time. ORF2 conservation was consistent across clinical categories (reproductive, systemic and surveillance). Phylogenetic clustering did not identify potential vaccine-escape clades or geographically confined divergent lineages.

Discussion and Conclusion

From 2021 through 2025, Canadian PCV3 ORF2 sequences remained highly conserved and closely matched the PCV3 Sequivity® vaccine ORF2 component, supporting the continued antigenic relevance of the vaccine in Canada and indicate no major ORF2-driven genetic shifts. Ongoing surveillance, including whole-genome analyses and field vaccine effectiveness, is recommended to detect future changes in viral epidemiology or vaccine performance.

IMM-PP-11

FIELD PERFORMANCE AND ECONOMIC IMPACT OF INTRADERMAL VERSUS INTRAMUSCULAR VACCINATION AGAINST MYCOPLASMA HYOPNEUMONIAE AND PCV2 IN SWINE

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Background and Objectives

Porcine circovirus type 2 (PCV2) and Mycoplasma hyopneumoniae are leading pathogens involved in the porcine respiratory disease complex, causing significantive economic losses through reduced growth performance, increased mortality, and elevated treatment costs. Effective vaccination strategies are essential to mitigate these impacts. The aim of this study is compare the field performance of an intradermal PCV2–M. hyopneumoniae vaccine with that of a conventional intramuscular bivalent vaccine under commercial production conditions.

Material and Methods

The present study was a retrospective analysis conducted on a commercial sow farm in Argentina, assessing two vaccination strategies against Mycoplasma hyopneumoniae and PCV2. The animals were vaccinated with an intradermal vaccine, MHYOSPHERE® PCV ID, using the Hipradermic® device (Group A [GA]) and with an intramuscular vaccine (Group B [GB]). During the nursery phase, 183 production batches were included, with 80 assigned to GA and 103 to GB. In the finishing phase, the number of monitored batches was 32 (GA) and 45 (GB). Key performance indicators, including average daily gain (ADG), mortality, and body weight at 70 and 164 days, were analyzed using linear and gamma regression models.

Results

In the nursery phase, GA showed significantly higher ADG (0.534 ± 0.029 vs. 0.497 ± 0.035 kg/day; $p < 0.001$), with no significant difference in mortality. In the finishing phase, mortality was lower in GA compared to GB (1.69% vs. 2.68%; $p < 0.01$), with 42% fewer batches exceeding 2% mortality. Although final body weight was similar, GA reached market weight 12 days earlier. Economic modeling estimated savings of up to US$ 2,218 per 1,000 pigs due to reduced mortality.

Discussion and Conclusion

The findings of this field study demonstrate that MHYOSPHERE® PCV ID provides health and performance outcomes. The intradermal strategy notably reduced mortality and improved nursery growth, indicating more effective protection during early production stages, when animals are particularly vulnerable to respiratory challenges.

IMM-PP-12

IMPACT OF VEROTOXIN VACCINATION ON MORTALITY AND GROWTH PERFORMANCES IN AN ITALIAN COMMERCIAL FARM

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Background and Objectives

In June 2022, Zinc Oxide (ZnO) ban in Swine industry changed drastically E. coli management in nursery and farrowing rooms. Verotoxin Producing Strain of E. coli (VTEC) may have a relevant impact on mortality, growth performances and on antimicrobial treatments frequency. The aim of the study was to evaluate the efficacy of a recombinant VT2e vaccine in a case of subclinical oedema disease in Italy.

Material and Methods

The study was conducted in a commercial herd farm with 3,000 sows located in the northeast side of Italy. Streptococcus-like symptomatology was present even with an amoxicillin and Clavulanic Acid medication. VEPURED® vaccine (1ml) was applied intramuscularly at 3-4 days of age (DOA). Piglets were weaned at 28 DOA for 3 consecutive 3-week batches. A total of 9,720 piglets (Group A vaccinated 3,298) and (Group B as control 6,422) were included in the trial and housed in three different nursery buildings for the next 6 weeks. Zootechnical parameters such as feed consumption, growth performance and mortality were collected.

Results

Vaccinated group A had lower nursery mortality (4,4% vs 2.7%) than unvaccinated group B (p-value<0,001). Furthermore, group A also was +2.89 Kg heavier than group B at the end of the nursery period. These positive results generated in group A a benefit of +8,92€ per pig at the end of nursery period due to less feed used.

Discussion and Conclusion

These results show that piglet vaccination with a recombinant VT2e vaccine, VEPURED® can prevent verotoxin effects on pig performance (mortality and grow) even in absence of clinical oedema disease symptoms. Prevention with a VT2e vaccine is a good tool for controlling mortality and increasing production performance on a subclinical oedema disease farm without using ZnO.

IMM-PP-13

GOOD VACCINATION PROCEDURES IN PIGS: CONTAMINATION LEVELS IN HIPRADERMIC® DEVICE VERSUS SYRINGES.

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Background and Objectives

Hygiene of syringes and Needle Free (NF) vaccination devices is part of Good Vaccination Practices (GVP) and a crucial practice to reduce the potential risk of pathogen transmission (Michiels et al., 2022; Vangroenweghe, 2017). The aim of the study was to compare the contamination level of HIPRADERMIC® (HD) and the syringes for intramuscular injections used on-farm.

Material and Methods

In six farms and five vet practices using both intramuscular needle-injection with IM Syringes and HD, 10 ml of water for injection was collected after the regular cleaning method of both devices. In case of HD, additional 10 ml was collected before the automated cleaning protocol (benzyl alcohol 4%) (HD PRE). Adenosine Triphosphate measurements (ATP, expressed in Relative Light Units, RLU) were performed as described in Michiels et al., 2019, with a threshold of 200 RLU as guideline to state when syringes were contaminated. A Wilcoxon test was performed to compare the results of the different groups.

Results

On average, IM syringes showed 244.4 RLU (min. 0, max. 902), while HD PRE presented 67.5 RLU (min. 24, max. 206). HD POST reached 30.5 RLU (min. 13, max. 57). In all but one sampling, the contamination level of HD decreased after cleaning. The contamination threshold was reached in three IM syringes, whereas none of the HD devices were positive after cleaning.

Discussion and Conclusion

The results of this study clearly show that HD presented lower contamination levels than IM syringes after cleaning (30.45 vs 244.4, $p<0.05$). Despite this lower contamination level, a proper cleaning of the device could further reduce the bacterial presence (67.5 vs 30.5, $p<0,05$), underscoring the importance of maintaining rigorous hygiene protocols. These findings support the implementation of standardized cleaning protocols and reinforce the value of NF devices in minimizing contamination risks.

IMM-PP-14

IMPROVED PERFORMANCE AND UNIFORMITY IN A PRRS UNSTABLE COMMERCIAL FARM USING DIFFERENT VACCINATION PROTOCOLS

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Background and Objectives

Effective control of key swine diseases such as Mycoplasma hyopneumoniae (Mhyo), Porcine Reproductive and Respiratory Syndrome (PRRS), Porcine Circovirus type 2 (PCV2), and ileitis is essential to maintain herd health and optimize production efficiency. Vaccination remains a cornerstone for disease control; however, differences in vaccine technology platforms—including antigen composition and adjuvant—can influence immune response and ultimately impact individual animals' outcomes. The objective of this study was to compare performance data (weight) over time following vaccination with two different vaccination programs.

Material and Methods

The study was conducted in a 350-sow farm (farrow to finish), located in the North East of Spain. The sow farm was PRRS unstable (II-B) and Mycoplasma hyopneumoniae positive. A total of 1000 piglets were included, divided in two groups. Both groups were vaccinated at weaning, 28 to 33 days of age (doa). Group 1 (500 animals) received Ingelvac FLEXCombo, Ingelvac PRRSFLEX and Enterisol Ileitis, whereas Group 2 (500 animals) received Porcilis PCV MHyo, Porcilis PRRS, Porcilis Ileitis. Weight gain was measured at 28-33 (doa), 95-96 doa and at 182-191 doa. Animals of both groups were balanced at the start and assigned randomly to group 1 or 2.

Results

Pigs in group 1 had a significantly lower mortality (12%) than group 2 (16%) (pδ0.05). Both groups had similar weights at the three timepoints providing evidence that both vaccination programs were efficacious. However, in group 1 there were distinctly less outliers than in group 2 on the 95-96 doa and 182-191 doa, providing evidence for a more consistent growth over time.

Discussion and Conclusion

Growth in Group 1 was more uniform, enabling more accurate forecasting of weight development. Further studies are needed to confirm this finding.

IMM-PP-15

MATERNAL SUPPLEMENTATION OF HYDROXY-SELENOMETHIONINE IMPROVES PIGLETS PERFORMANCE AND IMMUNITY UNDER HEAT-STRESS

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Background and Objectives

Selenium (Se) is essential for oxidoreduction and immune balances, particularly during gestation and under heat stress. Reduced Se levels can negatively impact sows reproductive performance and piglet development. Organic Se sources, especially hydroxy-selenomethionine (OH-SeMet), show higher bioavailability than seleno-enriched yeast (SeY) and inorganic sodium selenite (NaSe). This study investigates the impact of maternal OH-SeMet supplementation on offspring immune status and resilience to stress.

Material and Methods

Sixty Landrace×Yorkshire sows of similar parity and weight were divided into three groups (n=20): basal diet (BD)+0.3 mg/kg Se as NaSe, SeY, or OH-SeMet. The trial was conducted from gestation to weaning (day 21) under heat stress conditions (temperature-humidity index: THI>75, average temperature=27.1ºC and humidity=82.7%). Sows were vaccinated against PED and TGEV on gestation day 85. Blood biomarkers of a piglet/sow (day 21) were quantified by ELISA. Data were analyzed via one-way ANOVA and Tukey's honestly significant difference (HSD).

Results

OH-SeMet supplementation numerically improved piglets' survival compared to NaSe and SeY (11.5±0.3^{a} vs. 10.9±0.4^{ab} and 10.2±0.4^{b} piglets/sow, respectively, P=0.056), while significantly reducing diarrhea rate (3.3±0.5^{a} vs. 4.0±0.7^{ab} and 5.2±0.6^{b}%, respectively, P=0.050). Litter weight gain was also significantly higher compared to SeNa- and SeY-groups (59.5±3.0^{a} vs. 46.1±2.7^{b} and 45.5±3.3^{b}kg, P=0.003). Maternal OH-SeMet supplementation significantly (P<0.05) decreased piglets' blood inflammatory and stress biomarkers, including IL-1® (17.9±1.4^{b} vs. 25.4±1.1^{a} and 29.4±1.8^{a}pg/mL), IL-6 (463±42^{b} vs. 666±25^{a} and 624±41^{a}pg/mL), CRP (776±81^{b} vs. 1078±95^{a} and 874±77^{ab}µg/L) and Cortisol (103±4^{b} vs. 161±5^{a} and 170±6^{a}µg/mL), while increasing antibody titers against TGEV (0.063±0.004^{a} vs. 0.042±0.005^{b} and 0.044±0.006^{b}OD) and PED (0.57 ± 0.06^{a} vs. 0.39 ± 0.06$^{b\ and}$ 0.37 ± 0.06^{b}OD), respectively.

Discussion and Conclusion

Maternal OH-SeMet supplementation improved piglet immunity and stress status, lowering inflammation and raising PED and TGEV antibody titers. This led to better survival, stronger growth, fewer diarrhea cases, and overall greater resilience to heat stress compared with other selenium sources.

IMM-PP-16

EFFECT OF A NOVEL PCV2D AND MYCOPLASMA HYOPNEUMONIAE COMBINED VACCINE ON PCV2 ANTIBODY LEVELS, VIRAEMIA, ENZOOTIC PNEUMONIA-LIKE LESIONS AND PRODUCTIVE PARAMETERS

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Background and Objectives

This study sought to evaluate the efficacy of a novel PCV2d and Mycoplasma hyopneumoniae (Mhyo) combined vaccine (Cirbloc M Hyo®) compared to a routine vaccination protocol.

Material and Methods

This trial was conducted in a farm infected with a highly virulent PRRSV strain (Rosalia).At 3 weeks of age (woa), one piglet batch was distributed in two groups. Group A was immunized with Cirbloc M Hyo® and Group B was vaccinated with a PCV2 subunit vaccine + Hyogen®.Productive parameters were collected during the fattening phase from 280 animals per group, housed in two adjacent units. Moreover, 140 lungs per group were evaluated at the slaughterhouse using the Ceva Lung Program methodology.Blood samples were taken from 40 animals per group at 3, 6, 9, 12, 16 and 22 woa and processed by PCV2 PCR (5-sample pools). Additionally, sera from 3, 6, and 9 woa were tested by PCV2 ELISA (Porcine Circovirus type 2 Antibody Test Kit®, Biochek).ELISA results (S/P ratio) and enzootic pneumonia (EP)-index were analysed using a Mann-Whitney test. Significance was set at $p<0.05$.

Results

All PCV2 PCRs were negative in both groups.Significantly higher PCV2 antibody levels were observed in Group A compared to Group B at 6 (1.58±0.37 vs 1.12±0.44) and 9 (2.93±0.26 vs 2.03±0.62) woa.No significant differences were found in the EP-index between Group A (0.11) and Group B (0.05).Productive parameters of Group A compared to Group B were: mortality (%) 6.43 vs 6.79, FCR 2.129 vs 2.159, ADWG (kg) 0.73 vs 0.74, and medication cost (€/pig) 0.89 vs 0.97.

Discussion and Conclusion

The novel vaccine elicited a stronger and more uniform PCV2 humoral response than the PCV2 subunit vaccine. Both vaccination strategies effectively controlled PCV2 and Mhyo infections, despite the concurrent infection with a highly virulent PRRSV strain.

IMM-PP-17

SHORT-TERM BETA-1,3-GLUCAN SUPPLEMENTATION ENHANCES COLOSTRUM QUALITY IN HYPERPROLIFIC SOWS

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Background and Objectives

Colostrum quality is essential for piglet survival and early development. Beta-1,3-glucans (BG1,3) are recognized for their immunomodulatory properties and potential to improve colostrum composition. Their supplementation has shown benefits when fed from day 85 of gestation, but such long-term strategies are impractical in commercial systems. This study aimed to assess whether short-term BG1,3 supplementation during the final week before farrowing could enhance colostrum quality.

Material and Methods

A trial was conducted on a commercial farm in Portugal with 88 parity-3 hyperprolific TN 70 sows. Animals were allocated to a control group (n=42) or treatment group (n=46) receiving BG1,3, Aleta™, Kemin Industries at 300 g/t for eight days in the transition diet. Colostrum samples were collected from the first pair of teats and analyzed via Brix refractometry. Colostrum was retrospectively grouped by farrowing onset: 0–3 hours and 12+ hours. A one-way ANOVA using R evaluated differences in Brix values.

Results

Treatment sows in the 0–3 hour group (n=19) exhibited significantly higher Brix values (28.59) than control (n=16, 25.35), an increase of 3.24 ($p < 0.001$). In the 12+ hour group, Brix values of treated sows (n=25) averaged 23.63 compared to 21.10 in controls (n=22), a 2.53° improvement ($p = 0.013$).

Discussion and Conclusion

Short-term BG1,3 supplementation during the final gestation week significantly improved colostrum quality across groups, indicating a rapid and sustained physiological response. Top 75% of sows in the 0–3 hour treatment group had better colostrum quality than the top 5% of the control. More than 25% of BG1,3 sows had values above 30 degrees, very good quality colostrum according to Hasan et al. 2016 scale, whilst more than 25% of the control had colostrum values below 24, a number considered borderline. Targeted BG1,3 inclusion in transition diets represents a scalable strategy for modern pig production.

IMM-PP-18

EVALUATION OF SAFETY AND PCV2 IMMUNE RESPONSE INDUCED BY A NEW INTRADERMAL VACCINE COMPARED TO INTRAMUSCULAR VACCINATION IN A COMMERCIAL FARM

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Background and Objectives

PCV2 vaccines can be applied via the intramuscular or via the intradermal route. The aim of this study was to evaluate the safety and the PCV2 immune response of Porcilis® PCV M Hyo ID, and to compare it with the one elicited by a vaccine applied intramuscularly.

Material and Methods

The study was conducted in a commercial Spanish farm, PCV2 vaccinated, without clinical disease. Eighty piglets (21±2 days) were individually identified and randomly assigned to three groups: IDAL (n=30) vaccinated with Porcilis® PCV M Hyo ID; IM (n=25) vaccinated with Porcilis® PCV M Hyo intramuscularly; CONTROL (n=25); not-vaccinated. Rectal temperature was recorded at vaccination (21 days) and 24h, 7d, and 14d post-vaccination. Blood samples were taken at vaccination (3w) and at 6 and 9 weeks of age. PCV2 antibodies were measured with an in-house AlphaLISA (MSD Animal Health) and a commercial BioChek ELISA. PCV2 PCR was performed at 9w. Statistical comparisons used Pearson chi-square and two-way mixed ANOVA.

Results

No differences in rectal temperatures were observed between groups at any time. At vaccination, all groups showed moderate levels of MDA (IDAL 5.87 log2; IM 6.13 log2; CONTROL 5.92 log2; $p>0.05$). All animals were PCV2-PCR negative at 9w of age. By the AlphaLISA test at 9w, 96.8% of IDAL and 100% of IM piglets had antibody titers above protection level, versus 4.34% in CONTROL ($p<0.001$); BioChek results were similar. Quantitatively, at 9w, both vaccinated groups had significantly higher antibody titers than CONTROL in both ELISAs ($p<0.001$). Both ELISA tests showed a high significant association between results ($p<0.001$) with high level of concordance (91,1% at 9w). Correlation between Ab levels was positive, high and highly significant.

Discussion and Conclusion

Both intradermal and intramuscular vaccination showed a very strong PCV2 humoral response in all animals, clearly above protective level despite moderate MDA levels at vaccination.

IMM-PP-19

BORDETELLA BRONCHISEPTICA, AN UNDERESTIMATED PATHOGEN BEHIND IMPORTANT PIG LOSSES: THE VALUE OF A VACCINATION PROGRAMME.

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Background and Objectives

Bordetella bronchiseptica (BB), often underestimated, plays a critical role in non-progressive and progressive atrophic rhinitis in piglets. BB causes severe nasal turbinate degeneration, compromising respiratory health and productivity, and can lead to substantial economic losses in swine production systems worldwide. The objective of this study was to evaluate the benefit of Bordetella bronchiseptica vaccination on growth performance.

Material and Methods

On a French PRRS free, farrow-to-finish farm working with 280 sows, oral fluids were used to evaluate BB and Mycoplasma hyopneumoniae (M. hyo) by PCR in the post-weaning unit. Our study compares the performances of 10 batches before vaccination (7 173 pigs; NV-group), and 10 after the implementation of RHINISENG® in sows following manufacturer indications (7 375 pigs; V-group). Growth performance was evaluated based on slaughter data analysis. Apart from vaccination, no additional changes to improve respiratory health or performance were made during the study.

Results

Bordetella bronchiseptica and m.hyo mild presence (Ct 31.4 to 32.1 and 30,4 to 34,4 respectively) was confirmed by PCR on collective oral fluids between five and nine week old piglets. The $ADG_{8\text{-}115\ kg}$ was 709g in the NV-group and increased to 730g in the V-group ($p<0.001$); consequently the V-group was slaughtered 5 days younger and 300 grams heavier than the NV-group ($p<0.001$ and $p<0.005$ respectively). The percentage of carcasses classified in the optimal range was significantly higher in the V-group than in the NV-group, 82% and 79% respectively.

Discussion and Conclusion

All monitored parameters were significantly better in pigs born from vaccinated sows than those born from unvaccinated sows. On this farm, vaccinating reproductive sows with RHINISENG® effectively reduced the negative impact of Bordetella bronchiseptica on pig growth performance.

IMM-PP-20

FIELD EVALUATION OF A PCV2D/MHYO BASED VACCINE (RTU) IN A PCV2 SUBCLINICAL CHALLENGE HERD IN BRAZIL

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Background and Objectives

Porcine circovirus type 2 (PCV2) remains widely distributed, causing clinical and subclinical infections that affect growth and immunity. The objective of this study was to evaluate the efficacy of two PCV2/Mhyo (RTU) vaccination protocols on PCV2 viremia and seroconversion under field conditions.

Material and Methods

The field trial started on a commercial farm located in Santa Catarina State (Brazil). A total of 1470 piglets at 3 weeks of age (WOA) were allocated into two treatment groups: Group 1: one shot, 2 mL, IM of PCV2d/Mhyo RTU - CIRBLOC® M Hyo, Ceva Animal Health and Group 2: one shot, 2 mL IM of PCV2a subunit vaccine + Mhyo RTU. Both groups were maintained under identical housing and environmental conditions throughout the experiment period. ELISA (BioChek®) and qPCR analyses were performed at 3, 5, 7, 9, 16, 22 WOA. At slaughterhouse, 30 samples of lymphatic and lung tissues from each group were sampled for PCV2 detection by qPCR. The ELISA means data were analyzed using t-test. The qPCR means data were analyzed by Mann-Whitney test.

Results

Animals in Group 1 showed a significant difference in seroconversion compared to Group 2 (2.21 vs. 1.77) at 5 WOA and (3.18 vs. 2.58) at 7 WOA, $p<0.05$.Group 1 presented lower viremia levels compared to Group 2, no significant difference ($Log10^{2}$ vs $Log10^{4}$) at 7 WOA ($Log10^{2.6}$ Vs $Log10^{3.2}$) at 9 WOA and (Neg vs. $Log10^{7}$) at 16 WOA, $p>0.05$. Group G1 showed lower viral loads compared to Group G2 in lymphatic tissues ($Log10^{6.8}$ vs. $Log10^{9}$, $p< 0.01$) and in the lungs ($Log10^{5.3}$ vs. $Log10^{6.2}$, $p< 0.10$).

Discussion and Conclusion

Animals in Group 1 showed a significantly stronger serological response against PCV2. Furthermore, there was a marked reduction in viral load over time, where, from 16 WOA onwards, all vaccinated animals were negative for PCV2, while Group 2 was strongly viremic.

IMM-PP-21

USE OF AN MLA SWINE VACCINE AS A TOOL TO CONTROL ROTAVIRUS INFECTION IN THE FIELD

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Background and Objectives

Rotavirus A (RVA) infection causes neonatal diarrhea, malabsorption, dehydration, higher mortality and reduced weight gain in piglets, lowering weaning weights and farm productivity. Maternal vaccination with modified live attenuated (MLA) vaccines can elicit lactogenic immunity protecting suckling piglets through colostrum and milk antibodies, but field data quantifying benefits on growth are limited. The aim of this study was to evaluate an MLA RVA vaccine's efficacy in improving growth performance to weaning.

Material and Methods

The study was conducted on a 700-sow Iberian genetics farm operating on a 3week-batch farrowing system, that reported high incidence of diarrhea during lactation. Previous diagnostics identified a mixed infection in affected litters: enterotoxigenic Escherichia coli and Rotavirus A (genotype G9P[6]); yet antimicrobial treatment had produced poor responses. Three consecutive sow farrowing batches were selected for the study. In each batch, sows were randomized two months prior to farrowing and allocated to two different groups: half of the sows were vaccinated (Porcilis® Rota (MLA vaccine)) (VG; n=143) receiving two doses at 6 and 3 weeks before farrowing; the remaining sows served as controls (CG; n=148) and were left unvaccinated. Female piglets were individually weighed within 24h of birth and before weaning, as part of a selection program for future replacement gilts. Statistical comparisons were performed using the Mann-Whitney U test.

Results

There were no statistically significant differences in birth weight between groups (VG=1.488kg; CG=1.469kg). Vaccinated piglets had significantly higher weaning weights than controls (VG=6.652kg; CG=6.333kg; difference +0.319 kg; p=0.0002). Furthermore, farm staff reported visibly less diarrhea among litters from vaccinated sows.

Discussion and Conclusion

Under the conditions of this study, vaccination with an MLA swine vaccine against RVA was a valuable tool to prevent growth impairment in piglets during lactation due to RVA infection. Additionally, the reduction in overt diarrhea is likely to improve animal welfare.

IMM-PP-22

ASSESSMENT OF PASSIVE ANTIBODY TRANSFER IN PIGLETS FROM VACCINATED SOWS AGAINST SWINE INFLUENZA IN SPANISH SWINE HERDS

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Background and Objectives

Swine influenza is a major respiratory pathogen that predisposes pigs to secondary infections, leading to substantial economic losses. Control strategies rely on sow vaccination and passive immunization of piglets via colostrum. As an immune-dependent disease, sustained and high antibody titers are essential to protect piglets during the nursery phase. This study aimed to evaluate the duration and effectiveness of maternally derived antibodies (MDAs) in piglets born from vaccinated sows in Spanish swine herds.

Material and Methods

From 2023 to 2025, approximately 10,000 sows from nine farms were vaccinated with Gripork® at 6 and 3 weeks pre-farrowing, followed by mass revaccination every 6 months. Humoral responses were assessed in 431 sows - one week pre farrowing - before vaccination and - pre farrowing - every 4 months after vaccination. MDAs were evaluated in 1,286 piglets at 4, 6, and 8 weeks of age, both before and after colostrum intake from vaccinated sows. Serum samples were analyzed using a commercial ELISA kit (CIVTEST-Suis, Laboratorios Hipra SA). Seropositivity rates were calculated at each timepoint, and data were analyzed using a mixed linear model.

Results

Vaccinated sows exhibited significantly higher antibody levels compared to non-vaccinated sows (100.1 vs. 55.9; $p < 0.001$), with seropositivity increasing from 81.1% to 98.5% ($p < 0.001$). Colostrum-fed piglets born from vaccinated sows showed consistently higher maternal-derived antibody (MDA) levels across all timepoints, reaching statistical significance at 4 weeks ($p < 0.001$). The proportion of seropositive piglets was also significantly greater at 4 weeks (69.4% vs. 36%; $p < 0.001$) and 6 weeks ($p < 0.03$), but not at 8 weeks ($p = 0.167$).

Discussion and Conclusion

Gripork® vaccination significantly enhanced antibody titers in sows and improved passive immunity in piglets, offering protection up to 8 weeks of age.

IMM-PP-23

EVALUATION OF DIFFERENT VACCINATION AND MANAGEMENT STRATEGIES TO CONTROL NEONATAL DIARRHOEA IN SUCKLING PIGLETS ON A SPANISH SOW FARM

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Background and Objectives

Neonatal diarrhoea in suckling piglets is a multifactorial disease involving both viral and bacterial pathogens as well as management. It is one of the main causes of mortality and economic losses during the suckling phase. Prevention is essential, and an appropriate vaccination and management strategy for sows, focused on generating passive immunity through colostrum, is key. This study evaluated three different vaccination and management strategies to control diarrhoea in litters on a farm during the first days of life of the piglets.

Material and Methods

On a Spanish farm with 3,400 sows, three vaccination and management strategies were implemented following the instructions for administration route and dosage in the vaccine leaflet: Vaccines with inactivated Escherichia coli (E. coli), Clostridium perfringens (C. perfringens) type C toxoid, porcine rotavirus Type A, and weekly batch management (Group A: 1764 litters); Vaccines with E. coli, C. perfringens type C and A, Clostridioides difficile, porcine rotavirus Type A and weekly batch management (Group B: 955 litters). The same vaccination protocol as B, but within five-week batch management (Group C: 2262 litters). The studied KPIs were % of mortality, % of litters with diarrhoea, and % of litters with severe diarrhoea.

Results

In terms of mortality (%), C decreased to 14.2, while A and B remained at 17.78 and 17.59, respectively. Focusing on litters with diarrhoea (%), in A we have 60% ,while B decreased to 40%, and C to 20.1%, In terms of litters with severe diarrhoea (%) in A was 14.4% , in B it decreases to 7.6% and in C to 2.6%, differences in all the parameters among groups were statistically significant ($p<0.001$).

Discussion and Conclusion

In controlling neonatal diarrhoea, choosing a more complete vaccination protocol helps reduce the incidence and severity of diarrhoea in litters. In this study, a more complete vaccination protocol together with 5 weeks batch management helped reduce mortality during lactation.

IMM-PP-24

IMPACT OF AN INTRADERMAL VACCINE ON SLAUGHTER WEIGHT, LUNG LESIONS AND PLEURISY IN BRAZIL

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Background and Objectives

Mycoplasma hyopneumoniae negatively affects the performance of finishing pigs by increasing the incidence of pneumonia and pleurisy, reducing growth rates, and causing economic losses at slaughter due to greater lung lesion severity. This study aimed to evaluate the impact of an intradermal vaccine against M. hyopneumoniae and PCV2-associated diseases on a commercial pig farm.

Material and Methods

A randomized trial was conducted on a commercial farm with 2,000 sows in Brazil, positive for M. hyopneumoniae and showing a high prevalence of pneumonic lesions and pleurisy at slaughter. Group A (n = 391 piglets; GA) was intradermally vaccinated with MHYOSPHERE® PCV ID using the Hipradermic® device, while Group B (n = 403 piglets; GB) received an intramuscular combined vaccine against PCV2 and M. hyopneumoniae. Piglets were vaccinated at three weeks of age, balanced by litter, sex, and body weight, and monitored until slaughter. Growth performance was assessed through body weight at entry and at the end of fattening. Lung lesions were evaluated using lesion score, disease index and the incidence of affected animals by AI Diagnos (AI lung lesion assessment developed by HIPRA), while pleurisy percentage was determined according to slaughterhouse classification.

Results

GA showed higher final body weight (111.7 kg vs. 109.3 kg) and ADG (934 g vs. 901 g) with a shorter finishing period (92 vs. 94 days; $p = 0.07$). The incidence of pneumonia, lung surface affected, lesion index, and pleurisy percentage were significantly lower in GA (54% vs. 88%; 2.5% vs. 6.7%; 0.58 vs. 1.10; 1.9% vs. 2.1%, respectively; $p < 0.001$). Mortality did not differ between groups.

Discussion and Conclusion

MHYOSPHERE® PCV ID proved effective under high M. hyopneumoniae challenge, improving growth performance and reducing lung lesions at slaughter.

IMM-PP-25

BIRTHWEIGHT INFLUENCES PIGLET RESPONSE TO NEONATAL DIARRHOEA CHALLENGE AFTER SOW VACCINATION AGAINST CLOSTRIDIA AND E. COLI.

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Background and Objectives

Maternal-derived immunity protection against Neonatal Diarrhoea (**ND**) appears to show limited effect in low-birthweight piglets. This study compares sow ND vaccination effect on piglets with birthweight under and over 1kg.

Material and Methods

Twenty gilts in a 2500 indoor breeding unit in Spain with recurrent ND episodes involving Rotavirus type A and C, Clostridium perfringens type A, and Clostridioides difficile - were randomly allocated to two groups;
CON: Control treatment followed the farm vaccination protocol (Rotavirus A vaccine).
VAC: ND-vaccinated treatment included the farm protocol plus two doses of Suiseng Coli/C® combined with Suiseng Diff/A immunizing against E.coli, C.perfringens A and C, and C.difficile.

Daily clinical observations on litters (CON=120 piglets, VAC=116) and weights were recorded from birth to day 14th (D14).

Results

One fourth of piglets had δ1kg BW_0 (CON=24.2%; VAC=25.9%); there weren't significant birthweight (**BW0**) differences for piglets with **BW0≤1kg** (CON=0.94kg; VAC=0.92kg) or **BW0>1kg** (CON= 1.28kg, VAC=1.33kg).

BW0>1kg piglets presented differences in **severe diarrhoea prevalence** (CON=83.5%; VAC=72.1%; p<0.05) and **incidence** (CON=3.05 days/piglet; VAC= 1.56 days/piglet; p<0.001), **ADWG** at D14 (CON=41.9g; VAC=63.4g; p<0.05) and cumulative **mortality** at D14 (CON=30.8%; VAC=8.1%; p<0.05).

Contrarily, **BW0≤1kg** piglets presented significant differences in **severe diarrhoea prevalence** (CON=86.0%; VAC=66.7%; p<0.05) and **ADWG** at D14 (CON=33.6g; VAC=60.3g; p<0.05) but NOT in **severe diarrhoea incidence** (CON=2.73 days/piglet; VAC=2.07 days/piglet), or cumulative **mortality at D14** (CON=27.6%; VAC=26.7%).

Differences between treatments were significant when computing all piglets together.

Discussion and Conclusion

Low-birthweight piglets struggle to acquire maternal-derived immunity but still benefit from it reducing ND impact although it markedly differ from heavier piglets over 1 kg**.**Mortality is always naturally higher in low-birwthweight piglets; it prevented to detect mortality differences when treating ND.
However diarrhoea prevalence and ADWG clearly improved.

These findings are highly relevant when evaluating ND inteventions and trials, particularly in populations with high proportion of low-birthweight piglets.

IMM-PP-26

COMPARISON OF A COMBINED PCV2D AND M. HYOPNEUMONIAE NOVEL VACCINE AGAINST A READY TO MIX PROTOCOL IN A COMMERCIAL FARM.

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Background and Objectives

The aim of this study was to compare CIRBLOC M Hyo, a combined PCV2d subunit-based and Mycoplasma (M.) hyopneumoniae ready to use vaccine (RTU), against a PCV2a subunit-based vaccine and M. hyopneumoniae ready to mix (RTM) vaccination protocol, in terms of seroconversion and PCV2 viremia control.

Material and Methods

This trial was conducted in a 750 sows farm in Spain. At 3 weeks of age (woa), 40 piglets per group were selected, ear tagged and treated with one intramuscular dose of 2 ml of the RTU vaccine (group A) or with one intramuscular dose of 2 ml of the RTM combination (group B).Serum samples were taken from both groups at 3, 6, 9, 14, 18 and 22 weeks of age and were processed by PCV2 ELISA – Porcine Circovirus type 2 Antibody Test Kit (Biochek, Netherlands) at 3 and 9 woa, and by PCV2 and PRRS PCR (5-sample pools) in all sampling points. ELISA results (S/P ratio) were analysed using a Kruskal-Wallis test with pairwise comparisons. Significance level was set at $p<0.05$.

Results

All PCV2 PCRs were tested negative from 3 woa to 18 woa in both groups. At 22 woa, all PCV2 PCR pools were below 10^3 in both groups.At least one pool was tested PRRSv PCR positive since 6 woa to 22 woa in both groups.In group A, piglets had significantly higher PCV2 antibody levels at 9 woa (2.248. SD= 0.174; IC95%: 2.190-2.304) when compared to group B (1.525. SD= 0.496; IC95%: 1.357-1.693) ($p<0,001$)

Discussion and Conclusion

In the conditions of this field trial, both protocols showed high efficacy in terms of controlling the PCV2 viremia, even in the presence of PRRSv.CIRBLOC M Hyo vaccinated pigs showed a more homogeneous and higher seroconversion at 9 woa. This PCV2 antibody response may serve as a marker to check the correct animal vaccination with CIRBLOC M Hyo.

IMM-PP-27

STUDY OF THE HUMORAL IMMUNE RESPONSES USING A NOVEL NEEDLE-FREE INTRADERMAL VACCINE AGAINST PCV2 AND MESOMYCOPLASMA HYONEUMONIAE (M HYO), UNDER FIELD CONDITIONS

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Background and Objectives

Bivalent vaccines targeting Porcine circovirus type 2 (PCV2) and Mesomycoplasma hyopneumoniae (M hyo) are widely used for convenience and production benefits. This study characterized humoral response kinetics after administration of a new needle-free intradermal bivalent vaccine (Porcilis® PCV M Hyo ID) and evaluated whether ELISA testing can verify correct vaccination in a commercial herd

Material and Methods

On a 2,100-sow commercial PRRS-positive farm (sows vaccinated against PCV2), twenty piglets from different litters were randomly selected at 3 weeks, individually identified, and vaccinated with the intradermal vaccine. Blood was collected at 3 (baseline), 6, 9, and 14 weeks. Serum was analyzed with IDEXX M. hyo Ab Test (positive: S/P > 0.4) and Biochek PCV2 Ab Test (positive ε 1,071). Pooled RT-PCR for PCV2 (5 sera/pool) evaluated field virus exposure. Clinical observations continued through 14 weeks

Results

PCV2 antibody levels (mean values) were 4,608 at 3 weeks, 2,709 at 6, 3,712 at 9 and 3,675 at 14 weeks; seropositivity was 100% at all times. Pairwise comparisons were significant for 3 vs 6 weeks and 6 vs 14 weeks ($p < 0.001$). For M. hyo, mean S/P values were 0.30 (3 weeks), 0.065 (6 weeks), 0.055 (9 weeks), and 0.27 (14 weeks); statistical differences occurred between 3–6 weeks and 3–9 weeks ($p < 0.05$). Seropositivity rates were 25% at 3 weeks, 0% at 6 and 9 weeks, and 21.4% at 14 weeks. All pooled PCV2 PCR results were negative. No clinical signs attributable to PCV2 or M. hyo were recorded

Discussion and Conclusion

The intradermal vaccine induced a consistent, sustained humoral response to PCV2 through at least 14 weeks despite high maternal antibodies. ELISA responses to M. hyo were infrequent and variable, consistent with published mycoplasma vaccine data. PCV2 ELISA seroconversion therefore appears useful for monitoring correct administration of this vaccine in the field

IMM-PP-28

A COMBINED PCV2D AND MYCOPLASMA HYOPNEUMONIAE VACCINE EFFICIENTLY PREVENTS IMMUNE DYSREGULATION CAUSED BY THE RESPECTIVE PATHOGENS

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Background and Objectives

Mycoplasma hyopneumoniae (Mhyo) and PCV2 are responsible for global economic losses. Combined vaccination is rising due to its broad benefits. We evaluated immune protection induced by a new bivalent PCV2d–Mhyo vaccine, Cirbloc M Hyo (CEVA).

Material and Methods

Piglets were vaccinated at 3 weeks of age and challenged with Mhyo (Study A) or PCV2d (Study B) after 5 weeks post-vaccination (wpv); with non-vaccinated controls. At 2 wpv, 11 animals were sampled for BALF and PBMC restimulation (Luminex cytokine measurements). Serum antibody ELISAs for both pathogens were performed at 3 wpv. At 4 weeks post-challenge (wpch), lung lesions were scored, and quantified for cytokine mRNA(Study A). Pathogen loads were assessed in lymph nodes (LN) for Mhyo (Study A) and in blood, rectal swabs, lungs, LNs, and oral fluids for PCV2 (Study B).

Results

Vaccination induced strong ELISA seropositivity to both antigens and increased IL-6, IFN-©, and IL-1® in BALF at 2 wpv (0.4 vs 0.0, 1.28 vs 0.31, and 0.06 vs 0.04 ng/ml, respectively), indicating Mhyo-specific activation. In Study B, non-vaccinated PBMCs demonstrated elevated IFN-© and IL-10 after PCV2 restimulation (1.88 and 0.47 ng/ml), whereas vaccinated PBMCs suppressed them (0.77 and 0.12 ng/ml), consistent with adaptive memory. Post-challenge, vaccinated pigs showed negligible PCV2 viremia/shedding, and significantly reduced lung and LN viral loads.In Study A, vaccinated pigs had markedly lower lung lesion scores (0.15 vs 0.72) and Mhyo genome copies (often below detection) in LNs. Within lung lesions, vaccinates displayed higher IL-2 (0.88 vs 0.68) and reduced pro-inflammatory IFN-©, IL-6 and IL-17 expression (0.14 vs 0.22; 0.008 vs 0.024, and 1.69 vs 2.35 ng/ml, respectively), without differences in non-lesioned lung. Overall, reduced pro-inflammatory cytokines in vaccinates may limit lesion severity.

Discussion and Conclusion

Cirbloc M Hyo reduced infection-induced immune exacerbation and curtailed pathogen transmission, supporting improved pig health and productivity.

IMM-PP-29

DIETARY REPLACEMENT OF VITAMIN D3 BY 25-HYDROXYCHOLECALCIFEROL IMPROVED VITAMIN D STATUS AND BOOSTS ADAPTATIVE IMMUNE RESPONSE TO ACTINOBACILLUS PLEUROPNEUMONIA VACCINATION IN GROWING PIGS

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Background and Objectives

Vitamin D3 (VD) in pig diets is often replaced by 25-hydroxycholecalciferol (25-OH-D3) due to superior absorption, longer plasma half-life, and benefits for mineral regulation and bone health. However, its immunomodulatory role in fattening pigs remains poorly understood. This study evaluated the effect of replacing VD with 25-OH-D3 on porcine health biomarkers following vaccination against Actinobacillus pleuropneumoniae (APP).

Material and Methods

A total of 312 crossbreed pigs (Duroc × DanBred; 21.4 ± 3.8 kg BW) were assigned to two treatments (12 pens/treatment; 13 pigs/pen): VD (2000 IU/kg) or 25-OH-D3 (50 µg/kg), across three feeding phases (d0–21; d21–77; d77–98). Pigs were vaccinated against APP on d7 and d27. Performance (average daily weight gain, ADWG; average daily feed intake, ADFI and feed conversion ratio, FCR) was recorded per phase; plasma vitamin D metabolites were measured at d0, 8, 21, 28, 77, and 98; and IgA, IgG, haptoglobin (Hp), adenosine deaminase (ADA), and C-reactive protein (CRP) at d8 and d28. Data were analyzed using JMP Pro 19.0 ($P < 0.05$).

Results

Initial vitamin D status was deficient (11.5 ng/mL 25-OH-D3). Concentration of 1,25(OH)2D3 decreased ($P < 0.001$) after each vaccination, while IgG ($P < 0.001$) and CRP ($P = 0.06$) increased; Hp decreased ($P = 0.09$) between vaccination times. Pigs fed 25-OH-D3 showed higher plasma 25-OH-D3 and 24,25-OH-D3 at all points ($P < 0.001$) and higher IgG after the second vaccination (d28, $P = 0.02$). They also had greater ADFI ($P < 0.05$) and BWG ($P = 0.07$) after 21 days

Discussion and Conclusion

APP vaccination reduced circulating 1,25(OH)2D3, suggesting increased vitamin D demand by the immune system. Supplementation with 25-OH-D3 improved vitamin D reserves and enhanced IgG response, supporting adaptive immunity and vaccine responsiveness in growing pigs.

IMM-PP-30

CIRBLOC M HYO OUTPERFORMS A PCV2A–M. HYOPNEUMONIAE–L. INTRACELLULARIS VACCINE IN PCV2 CHALLENGE CONDITIONS

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Background and Objectives

Porcine circovirus type 2 (PCV2) plays a central role in the porcine respiratory disease complex. Effective vaccination must limit viraemia, viral shedding, and persistence in lymphoid tissues. This study compared a novel PCV2d–Mycoplasma hyopneumoniae vaccine, Cirbloc® M Hyo (CMH), with Vaccine A, a trivalent formulation including PCV2a, M. hyopneumoniae, and Lawsonia intracellularis, focusing exclusively on the PCV2 component.

Material and Methods

Piglets from a high-health herd were vaccinated intramuscularly at three weeks of age with either CMH or Vaccine A. At eight weeks, all animals were challenged with PCV2d. Post-challenge sampling assessed viraemia and rectal shedding (AUC), and PCV2 DNA (log10 copies/mL) was quantified in mesenteric, mediastinal, and inguinal lymph nodes at necropsy. Only PCV2 parameters were included in this analysis.

Results

CMH induced markedly lower levels of viraemia compared with Vaccine A (AUC: 0.000 vs 0.7228 log 10 copy / ⌠l x week). Rectal shedding followed the same pattern, with CMH pigs demonstrating substantially reduced excretion (AUC: 0.000 vs 2.020 log 10 copy / ⌠l x week).
LN viral loads also favored CMH: Mesenteric LN: CMH 0.73, Vaccine A 1.76; Mediastinal LN: CMH 0.93, Vaccine A 3.05; Inguinal LN: CMH 0.56, Vaccine A 1.72Both vaccines reduced PCV2 replication compared to controls, but CMH consistently achieved lower viral burden across all PCV2 tissues measured, for the lymph nodes significantly ($p<0.05$).

Discussion and Conclusion

Although a trivalent formulation offers broad pathogen coverage, the PCV2 component of Vaccine A was less effective than CMH in this challenge model. CMH produced stronger suppression of PCV2 replication, reflected in lower viraemia, decreased rectal shedding, and reduced viral loads in lymphoid tissues. These results identify CMH as the more efficient option for PCV2 control, an important advantage even when multivalent coverage is desirable for HERD HEALTH MANAGEMENT AND ECONOMY.

IMM-PP-31

COMPARATIVE ANALYSIS OF SOW VACCINATION PROGRAMS ON PIGLET PASSIVE IMMUNITY AGAINST INFLUENZA A IN MEXICO

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Background and Objectives

Sow vaccination against Influenza A virus (IAV) not only provides immunity to the breeding herd but also enhances passive immunity in piglets through maternally derived antibodies (MDAs), which play a key role in reducing IAV transmission. This study aimed to evaluate the effect of three sow vaccination protocols on passive immunity in piglets under field conditions in a Mexican commercial farm.

Material and Methods

Thirty gestating sows from an PRRS/IAV-positive farm with 2.000 sows (Jalisco, México), were randomly assigned to three groups and vaccinated at 6 and 3 weeks before farrowing. Group A (n=10) received a bivalent vaccine (GRIPORK®,HIPRA); Group B (n=10) received a trivalent inactivated vaccine (Flusure® XP, Zoetis); Group C (n=10) received a locally produced inactivated vaccine (Innovac® IP, Avimex). Humoral response in sows was assessed three weeks after the second dose, coinciding with farrowing. MDAs were evaluated in 40 piglets per group at 1, 3, 6, and 9 weeks of age using a commercial ELISA kit (CIVTEST-Suis, HIPRA).

Results

Group A showed consistently higher antibody titers compared to competitors. In sows, significantly higher levels of antibodies were observed in group A compared to Group B at 3 weeks after the second vaccine dose ($p=0.035$) with no significant difference between Groups A and C. Piglets from group A-vaccinated sows showed significantly higher antibody levels compared to Group B at weeks 3 ($p=0.012$) and 9 ($p=0.001$). Although titers declined at week 6, Group A maintained higher levels than Group B ($p=0.0001$) and C at week 9, with 80% positivity and 50% of samples exceeding a titer value of 80.

Discussion and Conclusion

GRIPORK® showed a greater increase in antibody titres in sows compared to the trivalent inactivated vaccine. In addition, the acquired passive immunity conferred by group A in piglets lasted longer and was higher until 9 weeks of age.

IMM-PP-32

BACTERIAL CONTAMINATION OF INTRAMUSCULAR AND INTRADERMAL INJECTION DEVICES: A DESCRIPTIVE MONITORING STUDY

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Background and Objectives

Recently more knowledge became available regarding contamination of automatic syringes (Michiels et al. 2022). Nienhof et al. (2017) briefly described that syringes can be contaminated with different bacteria, yeasts and molds. In case of needle-free vaccination devices (NF), there is no available knowledge. Therefore, the aim of the trial is to describe and compare the pathogens detected in NF devices and the intramuscular injection syringes used on-farm.

Material and Methods

In six farms and five vet practices using both intramuscular (IM) method and HIPRADERMIC® (HD) to vaccinate, 10 ml of water for injection was collected after the regular cleaning method on the farm/vet practice of the IM syringes and HD (HD POST). For the HD, an additional 10 ml was collected before the automated cleaning protocol (benzyl alcohol 4%) (HD PRE) and sent to DGZ (Flanders, Belgium) for aerobe culture.

Results

From six of the eleven IM syringes (54.5%), positive cultures with identifiable bacteria were obtained (Pseudomonas sp., Staphylococcus sp., Streptococcus alactolyticus, Stenotrophomonas maltophilia and Gram- negative unidentified bacteria). In only one of the HD PRE samples a positive culture was obtained (Staphylococcus saprophyticus) and two in the HD POST samples (Staphylococcus epidermidis and Micrococcus luteus). In all but one sampling, the HD POST samples showed the same or a lower number of colonies compared with the IM syringe samples from the same farm or vet practice.

Discussion and Conclusion

In conclusion from these preliminary it was observed that more than 50% of the IM syringes were contaminated with one or more species of bacteria, whereas only in 25% of the HD devices demonstrated a low number of bacterial species. The identification of these bacteria in IM syringes highlights the critical importance of material hygiene.

IMM-PP-33

MONITORING SEROLOGICAL RESPONSE AFTER USING A BIVALENT SWINE INFLUENZA VACCINE

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Background and Objectives

In Belgium, three main subtypes of swine influenza virus (SIV) are circulating within the swine population: H1N1, H3N2, H1N2. This case study aimed to evaluate the serological response against H1N1 and H3N2 after using a bivalent SIV vaccine (FIXR FLU) containing H1N1 and H3N2 SIV subtypes, measured by hemagglutination inhibition (HI) test.

Material and Methods

The monitoring was conducted on a commercial grower-to-finisher farm in Belgium, in a single 520-head unit. Twenty pigs (10 weeks old, mixed sex) were randomly allocated into two groups: a vaccinated group (n=10), receiving 2 ml of the vaccine intramuscularly at 12 weeks (D0) and 15 weeks (D21) and a control group (n=10) without vaccination.All pigs were housed in the same unit under identical environmental and management conditions. Blood samples were collected on D0 before vaccination and on D35, D49, D63, D77, D91, D105. Samples were analysed using HI test to detect antibodies against H1N1 and H3N2. The HI test contained similar antigens as vaccine constitution.Observation for adverse effects of vaccination was carried out the days of vaccinations.

Results

There was no mortality recorded neither respiratory of other clinical symptoms in both groups. No local and/or systemic reactions were recorded following vaccination. The vaccinated group showed an increase in average HI titers; D35 H1N1: 512, H3N2: 252; afterwards decreasing till D107. Average titers of controls remained below detection limit, except on D35 and D49 with values <40.

Discussion and Conclusion

The absence of clear serological response in controls, suggest absence of natural infection with H1N1 and H3N2. However, H1N2 HI titers were not assessed and absence of detectable HI titers does not definitively exclude natural infection. In the vaccinated group elevated HI titers against H1N1 and H3N2 were observed till D105, without local or systemic reactions under these conditions.

IMM-PP-34

FIRST USE OF A COMBINED INACTIVATED MYCOPLASMA HYOPNEUMONIAE BACTERIN AND PCV2D SUBUNIT VACCINE: A NEW STRATEGY FOR PRDC MANAGEMENT IN COMMERCIAL PIG FARMS

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Background and Objectives

Vaccination against Mesomycoplasma hyopneumoniae (M. hyo) and Porcine Circovirus Type 2 (PCV2) is considered as a first line prophylactic measures to tackle PRDC. The goal of this field evaluation is to assess the efficacy of a novel ready-to-use vaccine (Cirbloc® M Hyo) against latter pathogens in two farrow-to-finish farms mainly affected by PRDC and reduced biological performance.

Material and Methods

Assessment of vaccine efficacy was conducted in two farrow-to-finish farms with approximately 150 productive sows each and during a period of 8 months after vaccination. At the beginning of the assessment and throughout its duration, we evaluated circulation of PCV2 in serum in 4 different age groups (15 samples, 3 pools of 5 samples each), as well as slaughter lungs [1]. Assessment of biological performance and consumption of antimicrobials is still ongoing and will not be reported within the scope of this paper.

Results

Farm A tested positive for PCV2 at all examined time points (12 pools total: mid- and late nursery, and fattening phases), with complete suppression of viremia following vaccine introduction ($p < 0.000001$). In Farm B, 66.7% of all pools were positive during fattening; after vaccination, this rate decreased to 16.7% ($p = 0.24$). Lung health improved in both farms: the Enzootic Pneumonia (EP) index decreased from 4.0 to 3.1 in Farm A ($p = 0.2869$) and from 2.5 to 0.9 in Farm B ($p = 0.0037$). Both farmers observed less clinical symptoms and higher performance in their respective herds.

Discussion and Conclusion

Implementation of the new vaccine achieved strong suppression of PCV2d, eliminating viremia in farm A and reducing positivity in farm B. This reduction, combined with improved lung health and lower EP-indices, underscores the vaccine's effectiveness in mitigating PRDC. Beyond disease control, these results indicate significant potential for enhancing herd health, reducing economic losses, and improving productivity in farrow-to-finish systems.

IMM-PP-35

COMPARISON OF TWO DIFFERENT COMMERCIAL PCV2/MHYO RTU VACCINES IN BRAZIL AND ITS IMPACT ON LUNG HEALTH

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Background and Objectives

Mycoplasma hyopneumoniae (M.hyo) and Porcine Circovirus type 2 (PCV2) are important pathogens of PRDC. Vaccination has been one of the main tools to control both agents. Lung lesions are a strong indicator of the prevalence of enzootic pneumonia, in that sense the evaluation of bronchopneumonia-like lung lesions at slaughterhouse is a recognized method to assess the effectiveness of vaccines. This study aimed to examine the possible association of lung lesions at slaughterhouse with two different commercial RTU against M.hyo and PCV2

Material and Methods

A randomized, comparative field trial was conducted at a farm affected by PCV2 and M.hyo, the animals underwent two different protocols at weaning. Animals in Group 1: single dose 2 mL of Subunit PCV2d/Mhyo RTU (CIRBLOC® M hyo - Ceva Animal Health), 320 lungs. Group 2: two-dose vaccination of Mhyo + PCV2a/b RTU, 2 mL IM, 307 lungs. Average values were calculated for Ep like lesions, using t-test.

Results

The lungs evaluated from the animals in Group 1 showed a bronchopneumonia (BP) frequency of 24.61% and Group 2 was 35.56%. The percentage of the affected area was 1.8% and 2.25% for Groups 1 and 2, respectively. The incidence of dorsal-caudal pleurisy was 5.0% for Group 1 and 6.1% for Group 2. When comparing the scar lesions Group 2 had a 23.2% prevalence and Group 1 27.9%.

Discussion and Conclusion

Standardized assessment of lung lesions is a valuable tool for monitoring respiratory health in the herd and supporting more accurate decision-making when defining control protocols. The results showed that the vaccination with CIRBLOC® M hyo, was more effective, reducing the prevalence and severity of bronchopneumonia lesions compared to the protocol of Group 2.

IMM-PP-36

IMPROVEMENT OF REPRODUCTION PARAMETERS AFTER VACCINATION AGAINST LEPTOSPIROSIS ON 3 HUNGARIAN SWINE FARMS

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Background and Objectives

Leptospira are present all around the world, they are important pathogens and zoonotic. Not only the classical swine Leptospira: Pomona, Tarassovi or Bratislava can cause problems in swine. For example: Canicola, Icterohaemorrhagiae, or Gryppotyphosa – can effect the reproduction. The aim of this study was to get economic results after vaccination against the disease.

Material and Methods

On 3 Leptospira positive Hungarian farms (A+B+C) - bigger than 1000 sows, breeders vaccinated against Erysipelothrix rhusiopathiae, Porcine parvovirus and PCV2, and free from PRRSV - we vaccinated the breeders two times (4 weeks apart) with a combinated commercial Leptospira vaccine (Porcilis® Ery+Parvo+Lepto) followed by vaccination second week of lactation. Four reproductive parameters were compared: year nonvaccinated with year vaccinated (live born, pregnancy rate, mummies, abortions).

Results

We have found changes in terms of reproduction parameters: live born/litter and pregnancy rate increased; the prevalence of mummies, and abortions decreased spectecularly (.The increase in live born piglets/litter on the farms (total number): A: +1.48, B: +0.9, C: +1.2; the decrease of the mummified embryos/litter on the farms (total number): A: -0.08, B: -0.2, C: -0.1; the increase in the pregnancy rate percentage on the farms: A: +1.35, B: +2.1, C: +8.1; and the abortions prevalence changed on the farms (%): A: -67.7, B: -20.8, C: -68.4.

Discussion and Conclusion

Published data on Leptospira in swine in Hungary are relatively limited but indicate seropositivity at low to moderate rates (frequently in the range of ~5–30%). Results from this field case indicate a visible effect on reproductive parameters by introducing the Leptospira antigens in vaccination – assuming there will be an economic benefit for Leptospira-positive farms when being vaccinated. Further, vaccination against Leptospira offers the possibility to solve the disease with vaccination, instead of using antibiotics.

IMM-PP-37

EVALUATION OF AN AUTOGENOUS VACCINE AGAINST STREPTOCOCCUS SUIS WITH SEROTYPE 9 PIGLETS UNDER FIELD CONDITIONS

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Background and Objectives

Streptococcus suis (S. suis) is a major swine pathogen and an emerging zoonotic agent. Autogenous vaccines (AV) are commonly used to provide clinical protection, reducing disease incidence. This study evaluated the impact of a herd-specific S. suis autogenous vaccine on nursery mortality and antimicrobial consumption under field conditions.

Material and Methods

The study was conducted in a 690-sow farm, with a history of S. suis-related meningitis and arthritis in piglets during nursery (confirmed by isolation of S.suis serotype 9), with a before/after design (year vs year before, without management/biosecurity, coinfections, and treatment policy changes during this period).
An AV based on a serotype 9 (ST9) was produced by Ceva Biovac under Good Manufacturing Practice (GMP) standards.
Gilts and sows received two 2-mL doses 6 and 3 weeks pre-farrowing (wpf) for primary immunization, and subsequent parities were revaccinated only at 3 wpf.
A total of 39,631 piglets from twenty-four nursery batches, from non-vaccinated (NV, n=12, Sept-23 to Aug-24) and vaccinated (V, n=12, Sept-24 to Aug-25) sow groups, were monitored.
Post-weaning mortality and total amoxicillin use (g) per batch were recorded.
Mortality was analysed using a beta regression model, and antibiotic consumption was compared using a two-sample t-test. Significance was set at $p<0.05$.

Results

Mean post-weaning mortality was 25.4% ± 6.6 in NV batches and 14.8% ± 9.1 in V batches, showing a significant reduction in vaccinated animals ($p<0.001$).
Total amoxicillin use decreased from 3,366.042 ± 1,661.112 g in NV batches to 1,559.375 ± 984.758 g in V batches, a statistically significant 54% reduction ($p=0.004$; Cohen's $d=1.32$).

Discussion and Conclusion

In the conditions of this study, the S. suis autogenous vaccine was associated with a significant reduction in nursery mortality and antibiotic use.
Although ST9 is considered less immunogenic than ST2, these results suggest that herd-specific vaccination can help to reduce antimicrobial reliance, supporting its role within One Health strategies.

IMM-PP-38

FIELD TRIAL RESULTS COMPARING TWO PCV2 - MHYO COMBINED RTU VACCINES

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Background and Objectives

PCV2 and Mhyo vaccines are used in almost all piglets worldwide. Combined ready to use (RTU) vaccines have the advantage of easier administration. This study compared post-vaccination seroconversion against Mhyo and PCV2 and viremia control between two RTU vaccines.

Material and Methods

The study was performed in a 2200 sow farm in Spain producing around 1200 piglets per week. A whole batch was vaccinated before weaning with a combined RTU intradermal PCV2a+Mhyo vaccine (treatment A) and the next one with a combined RTU PCV2d+Mhyo vaccine (CIRBLOC® M Hyo, treatment B (CMH)).For each treatment, 36 piglets were randomly selected and individually ear-tagged for serological monitoring at vaccination and 3, 6, 9, 12, 16 and 22 weeks later. Viremia against PCV2 and PRRSv was assessed in 4 sample pools. At time of vaccination and 6 weeks later, antibody levels were assessed using ELISA Biocheck and Ingenasa PCV2 tests and ID Vet Mhyo ELISA test. Results were compared using Mann-Whitney test or chi-square test. Significant differences were considered at $p<0.05$.

Results

CMH group showed significantly higher seroconversion 6 weeks after vaccination in the PCV2 Biocheck ELISA than treatment A (S/P Value 2.578 (SD=0.41; IC95%=2.429-2.726) vs 1.265 (SD=0.53; IC95%=1.047-1.482) and in Ingenasa ELISA (S/P Value 0.570 (SD=0.185; IC95%=0.503-0.637) vs 0.469 (SD=0.159; IC95%=0.405-0.534) and also the percentage of PCV2 and Mhyo positive animals(96,88% vs 88.46%) and (53.12% vs 3.8%, $p<0.001$). PCV2 was never detected by PCR in both groups despite PRRSv circulating from week 6 to 12.

Discussion and Conclusion

Under the conditions of this study, CIRBLOC® M Hyo showed superior seroconversion against PCV2 and Mhyo 6 weeks after vaccination. PCV2 viremia was effectively controlled throughout the growth phase, as it was for treatment B, despite the presence of PRRSv from vaccination until 12 weeks later.

IMM-PP-39

COST-EFFECTIVE CONTROL OF GLAESSERELLA PARASUIS SEROTYPE 7: FIELD EVIDENCE FROM A PERU'S LARGEST SWINE OPERATION

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Background and Objectives

Glaesserella parasuis is the etiological agent of Glässer's disease, a common post-weaning pathology in swine production. Vaccination is a key strategy to reduce its clinical and economic impact. This study evaluated the effectiveness of vaccinating both sows and piglets to control mortality associated with confirmed polyserositis in the nursery phase at Peru's swine production company.

Material and Methods

On a 4,500-sow PRRS/IAV/Mhyo negative farm, G. parasuis serotype 7 was confirmed by PCR and serotyping with Ct values of 16.4. The existing protocol—sow vaccination at 60 and 90 days of gestation and piglet vaccination at 21 and 42 days with a locally produced vaccine —was insufficient to control disease impact. The piglet vaccination protocol switched to Hiprasuis® Glässer at 7 and 21 days of life. Between 25th October and 15th June 2025, a total of 37,200 piglets were analyzed in alternating batches: 18,600 vaccinated with the local vaccine (Group A) and 18,600 with Hiprasuis® Glässer (Group B). Nursery-phase mortality data were collected, including total mortality and Glässer-specific mortality. A chi-square test was used to compare outcomes. The economic benefit was calculated based on the opportunity cost of the additional slaughtered animals.

Results

Total mortality significantly decreased from 1.05% in Group A to 0.85% in Group B (−0.2 points; p = 0.047). Mortality attributed to Glässer's disease also showed a significant reduction from 0.56% to 0.38% (−0.18 points; p = 0.008). A 0.2 percentage point reduction in mortality resulted in a net benefit of 18,026 soles (€4,686) at the exchange rate of that period.

Discussion and Conclusion

This case report shows improved disease control after revising the piglet vaccination protocol. Early-life vaccines with cross-serotype protection enhanced post-weaning immunity, while sow vaccination remains essential to prevent G. parasuis transmission.

IMM-PP-40

SAMPLING OF LAWSONIA INTRACELLULARIS IN SLAUGHTERHOUSE AS A TOOL FOR COMPARATIVE EVALUATION OF TWO VACCINE ADMINISTRATION ROUTES.

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Background and Objectives

Porcine Proliferative Enteropathy caused by Lawsonia intracellularis is one of the most prevalent enteric diseases in European countries. Sampling at slaughterhouses for qPCR testing has been proposed as a good method for diagnosing the disease, so the aim of this study was to investigate whether there are different results in slaughterhouse sampling in animals vaccinated with different vaccination schedules.

Material and Methods

This study was conducted in a 3,000-place fattening unit housing two consecutive groups of pigs raised under the same conditions. Pigs at fattening were suffering from clinical Ileitis confirmed by qPCR in fecal samples. Group A was vaccinated with a modified live L.i. vaccine, Enterisol® Ileitis at 8 weeks of age, and Group B was intramuscularly vaccinated at 3 weeks of age with an inactivated intramuscular L.i. vaccine, Porcilis Laawsonia. A total of 50 ilea were collected per group, and set to laboratory to run qPCRFisher's exact test was used to compare the results

Results

None of the pigs' ilea of group A were positive, while 16% ($p<0,05$) of the pigs´ ilea in group B were positive with ct values between 26.05 and 38.22.Regarding the production parameters, the ADWG was 10 grams more per day in orally vaccinated group and the adjusted 18-100 feed conversion ratio were 54 grams less in the orally vaccinated group. The ROI was €1.45 more in the orally vaccinated group

Discussion and Conclusion

Slaughterhouse sampling for Lausonia intracellularis qPCR testing of ilea appears to be a good method to compare different control programmes for porcine proliferative enteropathy. Under the conditions of this study, oral vaccination is a more effective method to control Lawsonia intracellularis excretion until the final stages of pig growth.Under the conditions of this study, the group of orally vaccinated pigs performed better than the intramuscularly vaccinated pigs.

IMM-PP-41

EFFECT OF TWO DIFFERENT VACCINES ON CLINICAL SIGNS AND PRODUCTIVE PARAMETERS CAUSED BY NEONATAL DIARRHEA UNDER FIELD CONDITIONS

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Background and Objectives

Neonatal diarrhoea (ND) is a common and widespread problem on pig farms, causing productive losses and increasing antimicrobial use.
This study evaluated the impact on ND after sow vaccination against E. coli and C. perfringens type C (CPC) and type A (CPA) in comparison to another vaccine against E. coli and C. perfringens type C.

Material and Methods

The study was carried out on a Spanish farm historically affected by ND involving CPA.
Firstly, two groups of 30 sows were randomly selected, stratified by parity, and vaccinated with vaccine A (VacA; E.coli+ CPC) and vaccine E (VacE; E.coli+CPC+CPA; Enteroporc Coli AC®) applied according to SPC. Piglets were weighed individually at 24h (W24H) and 22 days of age (W22D), and average daily gain(g) (ADG24H-22D) was calculated.
In addition, one year of historical data on % total litters affected (%TLA), % litters affected sows 1st parity (%LA1P), piglet mortality (%M) related to diarrhoea, and duration/days of antimicrobial treatment (AT) from 423 sows vaccinated with vacA were compared to one year of data from 429 sows vaccinated with vacE.
Results were compared using Pearson Chi-square test, Mann-Whitney test, and linear regression adjusted by W24H. Significant differences were considered when $p<0.05$.

Results

In the comparative trial, ADG24H-22D was increased significantly in vacE in comparison to vacA (vacA:214.61±58.39 vs vacE:227.12±54.22).
Regarding the historical data, there were significant differences in vacE vs vacA for: %TLA= vacA:45.15% vs vacE:36.21%; %LA1P= vacA:67.74% vs vacE:42.22%; %M= vacA:0.94% vs vacE:0.13%; and AT=vacA:1.77 vs vacE:1.35.

Discussion and Conclusion

Under these field trial conditions, vaccination of sows against E. coli/C. perfringens (C and A) (Enteroporc Coli AC®) improved significantly the productive parameters in suckling piglets and reduced diarrhoea treatments, being an effective tool for reducing clinical signs and effects of neonatal diarrhoea.

IMM-PP-42

PCV2 ANTIBODY RESPONSE AFTER PIGLET VACCINATION WITH A NOVEL PCV2D AND MYCOPLASMA HYOPNEUMONIAE COMBINED VACCINE

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Background and Objectives

The objective of this study was to evaluate the effect of piglet vaccination with a novel PCV2d and Mycoplasma hyopneumoniae combined vaccine (CIRBLOC® M Hyo) on PCV2 seroconversion dynamics.

Material and Methods

This trial was conducted in two farms: A and B. At 3 weeks of age (woa), 80 piglets per farm were selected and distributed in two treatment groups. Animals from vaccinated group (n=40) were immunized with a single dose of CIRBLOC® M Hyo and piglets from control group (n=40) were kept unvaccinated. Blood samples were taken from both groups at 3, 7 and 9 woa.Serum samples were processed by PCV2 ELISA (Porcine Circovirus type 2 Antibody Test Kit®, Biochek) and by PCV2 PCR (5-sample pools). Moreover, PRRSV viraemia in piglets at 3 woa was assessed by PRRSV PCR.ELISA results (S/P ratio) were analysed using a Mann–Whitney test. Significance level was set at $p<0.05$.

Results

All PCV2 PCRs were negative in both farms.In farm A, vaccinated piglets had significantly higher PCV2 antibody levels than controls at 7 (2.37±0.37 vs 1.67±0.58) and 9 (2.22±0.33 vs 0.98±0.46) woa. Additionally, five PRRSV-PCR-positive piglets at 3 woa from vaccinated group were detected on farm A. These animals exhibited PCV2 antibody levels of 2.45±0.43 and 2.24±0.35 at 7 and 9 woa, respectively.In farm B, a significantly higher PCV2 humoral response was also observed in the vaccinated group compared to the unvaccinated one at both 7 (1.94±0.35 vs 1.20±0.45) and 9 (2.10±0.28 vs 0.68±0.30) woa.

Discussion and Conclusion

The strong and uniform PCV2 antibody response triggered by this vaccine may serve as a marker to verify successful animal vaccination.PRRSV viraemic piglets at the time of vaccination followed the same PCV2 seroconversion pattern as non-viraemic ones.

IMM-PP-43

FIELD TRIAL WITH A COMBINED PCV2D-MHYO VACCINE VERSUS TWO INDIVIDUAL PCV2A AND MHYO VACCINES

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Background and Objectives

PCV2 and Mycoplasma hyopneumoniae (Mhyo) are pathogens against which most piglets are vaccinated. The objective was to compare a combined PCV2d and Mhyo vaccine (CIRBLOC® M Hyo, treatment B) and a PCV2a subunit vaccine + HYOGEN® (treatment A) in terms of seroconversion, PCV2 viremia and safety.

Material and Methods

In a 1850 sow farm in Spain thirty-six piglets per treatment were randomly selected and ear-tagged for individual monitoring. Temperature was checked before vaccination, and 6, 24, and 30 hours later. Blood samples were taken at vaccination and at 3, 6, 9, 12, 16, and 22 weeks after vaccination to check PCV2 and PRRSv viremia and seroconversion using ELISA Biocheck and Ingenasa PCV2 and ELISA ID Vet Mhyo tests. Results were compared using Mann-Whitney test or chi-square test. Significant differences were considered at $p<0.05$.

Results

Treatment A showed significantly higher temperature increase than treatment B at 6 hours (40.06ºC (SD=0.38 IC95%=39.93-40.19) vs 40,5ºC (SD=0.49 IC95%=40.34-40.66) and 24 hours(39.8ºC (SD=0.44 IC95%=39.63-39.93) vs 39.3ºC (SD=0.33 IC95%=39.22-39.45). At vaccination and 30 hours after no differences were observed.Treatment B showed significantly higher seroconversion 6 weeks after vaccination in the PCV2 Biocheck ELISA than treatment A (S/P Value 2.633 (SD=0.174; IC95%=2.572-2.693) vs 2.004 (SD=0.466; IC95%=1.844-2.164) and Ingenasa ELISA (S/P Value 0.692 (SD=0.211; IC95%=0.618-0.766) vs 0.583 (SD=0.208; IC95%=0.512-0.654). The number of serologically PCV2 positive animals were also higher for treatment B (100% vs 89%). No seroconversion differences were observed with ID Vet Mhyo ELISA test. Treatment A had 2 positive PCV2 pools ($5.31x10^4$ and $1.47x10^5$ at 16 weeks) and one at 22 weeks ($<10^4$). Treatment B resulted in negative piglets in all samplings.

Discussion and Conclusion

In this field study, CIRBLOC® M Hyo showed improved safety and enhanced PCV2 viremia control and seroconversion 6 weeks after vaccination in a PRRSv positive situation.

IMM-PP-44

COMPARISON OF SEROLOGICAL RESPONSE AGAINST PCV2 AFTER PIGS VACCINATION WITH 3 COMMERCIAL VACCINES AGAINST PCV2 AND M. HYOPNEUMONIAE

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Background and Objectives

Vaccination against PCV2 and Mycoplasma hyopneumoniae is element of health management. The introduction of new product containing PCV2d genotype prompted an evaluation of the post-vaccination humoral response compared with other PCV2/Mhyo vaccines. The immune response induced by vaccines against PCV2 antigen was compared using the PCV2 ELISA (BioChek), which detects antibodies induced by field infection and post-vaccination.

Material and Methods

The study was conducted as part of routine herd monitoring on three Polish sow farms with a confirmed clinical history of PCV2 infection. Vaccinations were conducted on each farm at 4 weeks of age and included two parallel groups of piglets: farm “K” (350+350), farm “J” (1200+1200), and farm “C” (1500+1500). On each farm, Cirbloc® M Hyo (CMH) (PCV2d genotype) was used and compared to the RTM vaccine (farms “J” and “K”) or the I.D. vaccine (farm “C”). Blood samples were collected from 25 piglets from each group at 1, 4, 8, 15, and between 20-23 weeks of age, depending on the farm. Samples were analyzed using PCV2 ELISA (BioChek).

Results

Antibody levels were comparable in all groups across the three farms at 1 and 4 WOA. At 8 WOA only in CMH groups showed significantly increase of seroconversion in all farms „C” (S/P 1,53), „J” (S/P 1,65), „K” (S/P 2,05) versus RTM farms („J” S/P 0,58 „K” S/P 1,48) and I.D. farm („C” S/P 0,60). Following blood samplings showed increases in antibody levels only in the CMH groups.

Discussion and Conclusion

Only CIRBLOC® M Hyo (containing PCV2d) induced an increase in PCV2 antibody levels in post-vaccination samples, in contrast to the groups treated with RTM and I.D. vaccines. The observed increase in antibody titers following administration of PCV2d antigen may serve not only as evidence of high immunogenicity but also as a practical indicator of vaccination quality.

IMM-PP-45

COMPARISON OF TWO PCV2/MHYO RTU VACCINE PROTOCOLS ON PERFORMANCE EFFECTS

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Background and Objectives

Two of the main pathogens in swine production are PCV2 and Mycoplasma hyopneumoniae (Mhyo). Present worldwide, they are responsible for significant losses on farms, making the efficient control essential. The objective of this study was to compare two PCV2/Mhyo RTU vaccination protocols using zootechnical data from a commercial farm in Brazil.

Material and Methods

In a farm located in the state of Santa Catarina, with 2300 sow, 1470 animals were divided into two groups: Group 1: animals vaccinated with Cirbloc Mhyo®: PCV2d/Mhyo RTU subunit vaccine, 1 shot, 2 mL, IM at 3 weeks of age (WOA), N= 765 and Group 2: animals vaccinated with PCV2a/Mhyo RTU subunit vaccine, 1 shot, 2 mL, IM at 3 WOA, N= 705. The animals were distributed in the same room, under the same management and facilities conditions. The animals were weighed individually at 3, 10 and 22 WOA. Feed consumption was measured per pen during all weeks of study. The data were evaluated using Mann-Whitney test.

Results

The initial weight of G1 and G2 was 5.269 Kg vs 5.275 Kg ($p>0.05$). Weight gain in group 1 was 1.032 Kg higher than in group 2 (129.470 Kg vs. 128.438 Kg), $p<0.10$. Feed conversion ratio of groups G1 and G2 was 1.963 vs 2.004, $p>0.05$.

Discussion and Conclusion

The difference in weight gain of 1.032 Kg and the 0.041 points reduction in feed conversion ratio in G1 implies a substantial economic impact per animal. These results demonstrate that the PCV2d/Mhyo Subunit vaccine can be an excellent tool for controlling the pathogens involved and contributing to improved farm productivity and profitability.

IMM-PP-46

COMPARATIVE STUDY OF THREE COMMERCIAL VACCINES AGAINST MYCOPLASMA HYOPNEUMONIAE AND PORCINE CIRCOVIRUS TYPE 2 IN A FRENCH SWINE HERD

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Background and Objectives

Despite high vaccination rates against Mycoplasma hyopneumoniae (Mhyo) and Porcine Circovirus type 2 (PCV2), these pathogens remain a major challenge in French swine herds. This study compares, under contemporary field conditions, three commercial vaccines and a placebo on a French pig farm, with a focus on enzootic pneumonia.

Material and Methods

This study was conducted on a French farrow-to-finish farm with 200 sows, following evidence of active Mhyo circulation from weaning to slaughter. Mhyo positivity was confirmed by PCR at different production stages (oral fluids and tracheal swabs), whereas no PCV2 circulation was identified during the study period. At weaning (28.6 ± 0.72 days old; 8.1 ± 1.51 kg), 256 piglets were allocated to four treatment groups balanced for body weight and sow origin: three vaccines (A: 2 + 0.5 mL intramuscular [IM]; B: 0.2 mL intradermal [ID]; C: 2 mL IM) and a placebo (D: 2 mL saline, IM). Piglets were housed by treatment in pens of eight animals until slaughter. Body weight was recorded at weaning, at the end of nursery, and at the end of fattening. Lung lesions and pleuritis were scored at slaughter using a seven lobes scoring system according to Malitte, 1974. Growth performance was analyzed using linear models with the pen as the experimental unit, whereas lung lesion scores were analyzed using a Poisson model, with the animal as the observational unit, acknowledging potential pen-level clustering.

Results

At each time point, no significant differences in growth performances (body weight and ADG) were observed. No significant differences ($p>0.05$) were observed in lung lesions scores (A: 2.2 ± 1.80; B: 2.0 ± 1.54; C: 2.5 ± 1.54; D: 2.2 ± 1.80) between groups.

Discussion and Conclusion

Although no significant differences were observed between groups, further studies with larger sample sizes are required to confirm these findings.

IMM-PP-47

EFFECT OF THREE DIFFERENT COMBINED VACCINES ON PCV2 AND MYCOPLASMA HYOPNEUMONIAE SEROCONVERSION AND PCV2 VIREMIA

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Background and Objectives

Vaccination has been one of the main measures to control Mycoplasma hyopneumoniae (Mhyo) and Porcine Circovirus type 2 (PCV2). Verifying the serological vaccine response is a useful tool to evaluate vaccination efficiency.
The objective of this study was to assess Mhyo and PCV2 seroconversion pattern and PCV2 viremia of different combined vaccines.

Material and Methods

In a 1600 sow farm in Spain, 108 piglets at weaning from 36 litters were randomly selected and ear-tagged (3 piglets per litter, one for each group) according to the vaccine received:
-CIRBLOC® M Hyo group (VacC)
-Intradermal vaccine group (VacID)
-Intramuscular vaccine group (VacIM)
Blood samples were taken at vaccination, 6, 9, 12, 16 and 22 weeks of age (woa) to check PCV2 and PRRSv viremia.
Seroconversion at vaccination and 6 weeks later was evaluated, using two PCV2 ELISAs (Biochek and Ingenasa), and ELISA IDvet Mhyo tests.
Results were compared using Kruskal-Wallis test with pairwise comparisons and Pearson Chi-square test. Significant differences were considered when $p<0.05$.

Results

VacC piglets showed significantly higher levels of antibodies against PCV2 by an increased mean of S/P value at 6-weeks after vaccination compared to VacID and VacIM:
S/P value Biochek ELISA: VacC: 2.709±0.202; VacID: 1.411±660; VacIM:1.357±0.753.
S/P value Ingenasa ELISA: VacC: 0.786±213; VacID: 0.516±0.230; VacIM: 0.607±0.319.
The number of serologically PCV2 and Mhyo-positive piglets was also significantly higher for VacC compared to VacID and VacIM:
100% vs 91,43 and 80% with PCV2 Biochek;
100% vs 94,24 and 77,14% with PCV2 Ingenasa;
97,14% vs 77,14 and 77,14% with Mhyo IDvet.
PCV2 viremia was not detected, despite PRRSv circulating in all 3 groups.

Discussion and Conclusion

Under the conditions of this study, CIRBLOC® M Hyo showed better PCV2 and Mhyo seroconversion after vaccination.
The stronger and more homogeneous serological response demonstrates that the PCV2 Biochek ELISA can serve as a reliable tool to evaluate the vaccination efficiency with this vaccine.

IMM-PP-48

INITIAL INSIGHTS INTO THE SAFETY AND SEROCONVERSION FOLLOWING THE SIMULTANEOUS OFF-LABEL USE OF TWO COMMERCIAL VACCINES

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Background and Objectives

n pig production, sows receive multiple injections to comply with vaccination programs. Combining vaccinations can help reduce the number of handling and administration days. This study evaluated the safety and antibody response of two multivalent vaccines when administered simultaneously.

Material and Methods

Fourteen gilts from a high health status nucleus herd (Mycoplasma hyopneumoniae (M. hyo)-free) were randomly allocated to either a "Simultaneous vaccination" group (S; n = 10) or a "Non-vaccinated" group (NV; n = 4). Gilts in group S received intramuscular injections of both CIRBLOC® M. hyo and RESPIPORC® FLU 3 on day 0 (D0) and day 21 (D21). Safety was assessed through local reactions and rectal temperature measurements at D0, D1, D21, and D22. Antibody responses were evaluated at D0, D21, and D42 using the IDEXX M. hyo Ab test, INgezim Circo IgG for PCV2, and HI assays for swine influenza A virus (swIAV) with H1avN1, H1huN2, and H3N2 antigens.

Results

On D1, none of the vaccinated gilts showed a temperature increase of ε1°C, and only three displayed transient induration at the injection sites. Following the second administration, four gilts reached 40°C but showed no associated clinical signs (no apathy or anorexia). Six animals exhibited transient local induration. At D0, all gilts were seronegative for M. hyo and swIAV, and 50% were seronegative for PCV2. Throughout the study, animals form the NV group remained negative for M. hyo and swIAV antibodies and stable for PCV2. In contrast, by D42, all vaccinated gilts had seroconverted for M. hyo, swIAV, and PCV2.

Discussion and Conclusion

These findings provide initial evidence regarding the safety and serological response associated with the simultaneous off-label administration of two commercial vaccines.

IMM-PP-49

SEROLOGICAL RESPONSE AND EFFICACY OF A DUAL INACTIVATED VACCINE AGAINST MYCOPLASMA HYOPNEUMONIAE AND PCV2 IN COMMERCIAL SWINE PRODUCTION

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Background and Objectives

Respiratory and systemic diseases caused by Mycoplasma hyopneumoniae (M. hyo) and porcine circovirus type 2 (PCV2), particularly the PCV2d genotype, continue to pose significant health and economic challenges in commercial swine production. This assessment aimed to evaluate the serological response and protective efficacy of a newly formulated dual inactivated vaccine containing a M. hyo and PCV2d (Cirbloc® M Hyo) antigen after vaccination of three-week-old piglets.

Material and Methods

Assessment of vaccine efficacy was conducted in a farrow-to-finish farm with approximately 600 productive sows (multi-site). PCV2 circulation was collected from four age groups, before and after vaccination, using three pooled serum samples per group (mid- and end-nursery, mid- and end-fattening; RealPCR, Idexx). Slaughter lung lesions were assessed macro-anatomically, and analyzed for pathogens pre- and post-vaccination. Seroconversion to M. hyo and PCV2 was measured in 15 preselected piglets 8 weeks post-vaccination using two commercial ELISAs (ID Screen® Mycoplasma hyopneumoniae Competition ELISA and the BioChek Porcine Circovirus type 2 Antibody Test Kit).

Results

Pre-vaccination, PCV2d presence was detected only in the fattening unit, with Ct values of 24, 35, and 36 across pooled samples. Bronchopneumonic lungs showed PCV2d with a Ct-value of 26, despite overall low lung lesion scores. Strong seroconversion was observed 8 weeks post-vaccination: in M. hyo, S/N 50%-values dropped from 41.3 to 23.1 ($p=0.0223$), and total number of PCV2 antibodies increased from 1971.6 to 5844.5 ($p=0.0001$). No viral shedding was detected in vaccinated pigs during fattening. EP-index values were consistent among vaccinated pigs (0.35 and 0.32). PCV2 was still detectable in lungs post-vaccination, but at very low levels (Ct 37).

Discussion and Conclusion

Present formulation achieved clear seroconversion against M. hyo and PCV2. Most importantly, PCV2d excretion, detected before vaccination, disappeared in serum during fattening and was found in traces in slaughter lung lesions. Overall, the vaccine provided effective protection under field conditions.

IMM-PP-50

USE OF PCV2 HUMORAL ANTIBODY DETECTION AS A METHOD TO VERIFY PROPER PCV2 VACCINATION IN A NEW COMMERCIAL PCV2 VACCINE

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Background and Objectives

Some PCV2 commercial vaccines have shown to induce a very strong humoral response. This fact, in combination with PCV2 PCR , allows the use of post-vaccination seroconversion as a compliance way to demonstrate proper vaccination of piglets. The aim of this trial was to study the humoral immune response induced by a new intradermal PCV2 vaccine and its possible use as a method to verify proper vaccination.

Material and Methods

In 18 commercial Spanish farms piglets were vaccinated at 3–4 weeks with the new intradermal bivalent vaccine Porcilis® PCV M Hyo ID (MSD Animal Health). Six weeks post vaccination, 407 piglets (9–10 weeks old) were bled. PCV2 antibodies were measured with the semi-quantitative Biochek PCV2 Ab ELISA. PCV2 PCR was additionally performed to exclude field infection.

Results

All samples were PCV2 PCR negative, indicating antibody responses were likely vaccine-derived. Among 407 samples, 40 were PCV2 antibody-negative, resulting in 89.68% overall seropositivity. Average titer of positives was 3,207 (positive >1071). On farm level, positivity ranged from 75% to 100%; average titers ranged from 2,462 to 4,446. No correlation was found between percentage positive and mean PCV2 titer at farm level.

Discussion and Conclusion

The results of this trial show that in all farms studied the new vaccine induced a clear PCV2 immune response 6 weeks post-vaccination detected by a commercial PCV2 ELISA. These results are especially useful as they suggest that a simple serological test performed 6 weeks post-vaccination, in combination with PCV2 PCR to ensure that no field virus is recirculating, makes it possible to verify proper administration of the vaccine and, therefore, to implement corrective measures if necessary.

IMM-PP-51

COMPARATIVE SAFETY AND EFFICACY TRIAL OF DIFFERENT COMMERCIAL VACCINES AGAINST MHYO & PCV2 AFTER A CHALLENGE OF MYCOPLASMA HYOPNEUMONIAE

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Background and Objectives

The aim of this study was to compare the safety and efficacy against Mycoplasma hyopneumoniae (Mhyo) of recently launched Mhyo/PCV2 commercial vaccines.

Material and Methods

This study included 100 three-week-old piglets seronegative against Mhyo divided into 5 groups (20 piglets/group): T01 (MHYOSPHERE® PCV ID administered with Hipradermic®); T02 (Cirbloc® M Hyo intramuscularly; T03 (Porcilis® PCV M Hyo ID, administered with IDAL®; T04 (Porcilis® PCV M Hyo ID mixed with Porcilis® Lawsonia ID, administered with IDAL®), and T05 (PBS-IM) as the control group. Safety variables were assessed post-vaccination. All groups were challenged intranasally at 11 weeks of age with a highly virulent strain of Mhyo over three consecutive days. Three-weeks post-infection, the animals were euthanized, and the affected lung surface was assessed according to Christensen et al, 1999

Results

The local reactions caused by T03 and T04 lasted until 49 days post-vaccination, whereas T01 and T02 lasted for 21- and 14-days post-vaccination, respectively. At these timepoints the percentage of affected animals was significantly higher for T03 and T04. Body temperature returned to control values 24h after vaccination only in T01. Lung lesions related to Mhyo infection were significantly reduced ($p < 0.05$) compared to the control group (T05 [4.6 % of lung affected surface]) only in three vaccines. (Group [% affected lung surface, % reduction]: T01 [1.6, 64.6]; T02 [2.24, 51.3]) and T03 [1.3, 71.7]) out of the four tested (T04 [6.41, -39.3]).

Discussion and Conclusion

The present study showed that T01 returned to baseline body temperature earlier than other groups. The incidence of local reactions of T03 and T04 was significantly higher and persisted for a longer duration. Three of the four vaccination programs were able to reduce lung lesions compared to the control group. The associated use of Lawsonia vaccine may diminish the efficacy of T03 against Mhyo.

IMM-PP-52

IMPACT OF A PCV2D/M.HYO COMBINATION VACCINE ON RESPIRATORY PATHOGEN PREVALENCE AND PERFORMANCE ON A DUTCH PIG FARM

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Background and Objectives

To evaluate the effect of a novel PCV2d based PCV2/Mycoplasma hyopneumoniae (M.hyo) combination vaccine on respiratory pathogen prevalence and growth performance on a Dutch organic pig farm suffering from PRDC.

Material and Methods

A closed organic farm of 56 sows suffering from PRDC was monitored before and after adding PCV2 vaccination to the piglet vaccination protocol. Previously piglets were vaccinated against M.hyo with a monovalent M.hyo vaccine (1ml, I.M.) and against edema disease. In the new vaccination protocol, the monovalent M.hyo vaccine was replaced by Cirbloc® M Hyo (2 ml, I.M.) at 3w of age (vaccine A). qPCR testing for PCV2, M.hyo, swIAV and PRRSv was performed on pools of 5 nasal swabs of 6 age groups in the period before implementation of vaccine A, the transition period and when all pigs were vaccinated with vaccine A. All pigs were equipped with electronic (RFID) ear tags making individual follow-up of animals possible until slaughter.

Results

PCV2 detection in nasal swabs decreased from 6/6 age groups before to 4/6 age groups after full implementation of vaccine A and a reduction in PCV2 viral load was observed from respectively 3/6 to 0/6 age groups with Ct <30. M.hyo detection dropped from 2/6 to 1/6 groups. swIAV H1avN2 was eliminated (before 2/6 groups were positive with Ct <30), and PRRSv type 1 (EU) decreased from 4/6 (Ct <30 in 3/6) to 1/6 groups (Ct <30). Average daily carcass weight gain from birth to slaughter improved from 466 to 505 g/day.

Discussion and Conclusion

The new vaccination strategy reduced the prevalence of respiratory pathogens and improved the growth performance. The overall improvement of the health status, not only of PCV2, might be explained by the immunosuppressive nature of PCV2, allowing vaccinated pigs to better fight other diseases.

IMM-PP-53

PRRS VACCINATION PROTOCOLS AND NEONATAL PRRSV STATUS IN THE NETHERLANDS: A DESCRIPTIVE FIELD STUDY

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) remains a major challenge in swine production in the Netherlands. Despite >90% of sow herds being vaccinated, monitoring shows that approximately 55% of herds have at least one PRRSV PCR-positive farrowing batch per quarter. Vaccination protocols vary widely for sows and piglets. Monitoring neonatal piglets provides an early indication of herd status. This study gives a retrospective overview of PRRSV vaccination strategies that are used and explores associations with neonatal PRRSV prevalence.

Material and Methods

Between February 2023 and October 2025, neonatal samples were collected from 27 Dutch sow herds (average 1,165 sows/herd). Farms submitted ε6 sample batches within three months under their specific vaccination protocols. PRRSV detection was performed by PCR in one of three accredited laboratories; qualitative results were considered comparable. Vaccination protocols and PCR outcomes were analyzed descriptively.

Results

Batch vaccination = vaccination at specific moments in the sow cycle. Mass vaccination = whole herd vaccination 3 or more times a year. Overall, 37% of farms had no PRRSV-positive neonatal batches. Sow vaccination protocol: Batch vaccination (52% of farms): 29% average positivity; Mass vaccination (41%): 25%. Sow vaccine type: Killed vaccine (KV, 11%): 51%; Modified live vaccine (MLV, 59%): 22%; MLV+KV (26%): 33%. Piglet vaccination (MLV only): No piglet vaccination (33%): 23%; 1st week vaccination (15%): 61% (all these farms used KV or MLV+KV in sows); 3rd week vaccination (48%): 18%.

Discussion and Conclusion

Causal relationships cannot be inferred from this dataset. In sows all mass-vaccinated herds used MLV, while KV was limited to batch protocols. Early piglet vaccination (1st week) correlated with higher neonatal PRRSV prevalence. It is worth noting that timely immunity from vaccination may not be achieved when neonatal prevalence is high. Our conclusion is that stabilizing sow herds is to be prioritized first before discussing piglet vaccination strategies.

IMM-PP-54

NEW RANGE OF VACCINE ADJUVANTS, ICTYOLANE, CAN PROMOTE IFN© PRODUCING CELLS IN AN OPTIMIZED SAFETY PROFILE

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Background and Objectives

Swine vaccines development is challenging to obtain effective cellular immune response. Water-in-Oil (W/O) emulsions based on mineral oil can be used to obtain strong antibody response and proliferation of IFN© producing cells, but local reactions at the injection site such as inflammation, fibrosis or abscesses are limiting their use. Here we present the development of two vaccine adjuvants rendering Oil-in-Water (O/W) emulsion, intended to induce strong immune response in an optimized safety profile; Ictyolane 15, based on mineral oil and Ictyolane 23D based on biodegradable oil and amphiphilic immunostimulant.

Material and Methods

Vaccines with a Influenza wild type NP recombinant protein were prepared and administrated to 4 groups of 5 week-old piglets in a two shots vaccination scheme 28 days apart , including one goup with each O/W test items, a W/O vaccine formulation positive control and antigen (Ag) alone group . Total antibody response was assessed after the primo-vaccination, the booster dose and at sacrifice of the animals at day 56. The spleen of half groups were harvested 10 days after the boost and the IFN© producing cells were numerated. General safety has been followed up after each vaccination and local reactions at injection site have been evaluated after the sacrifice of the piglets

Results

All adjuvanted vaccines groups induced a significantly higher response compared to Ag group for total IgG and IFN©. W/O formulation induced a higher response than O/W formulations. A strong booster effect has been noticed at day 56 with O/W vaccines. Grade 2 local reactions (on a scale of 4) were noticed at the injection site with W/O formulation, no reaction was observed with O/W vaccines

Discussion and Conclusion

Two new O/W vaccine adjuvants have shown a significant immune response as compared to antigen alone, and a very high safety profile. They are promising adjuvants to obtain safe and efficient commercial vaccines for swine.

IMM-PP-55

FIELD EVALUATION OF A NEW READY-TO-USE SUBUNIT VACCINE CONTAINING INACTIVATED MYCOPLASMA HYOPNEUMONIAE AND PCV2D ANTIGEN IN A FATTENING FARM WITH SEVERE RESPIRATORY DISTRESS AND POOR ECONOMIC PERFORMANCE

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Background and Objectives

Porcine Circovirus Type 2 (PCV2) and Mesomycoplasma hyopneumoniae (M.hyo) are major pathogens within the porcine respiratory disease complex (PRDC). Here we report the impact of introducing CIRBLOC® M Hyo – vaccinated pigs into a fattening herd with severe PRDC and reduced performance.

Material and Methods

Present case report occurred in a 1,280-fattening herd (outdoor-system), positive for swIAV, PRRSV-1, M.hyo and PCV2d. Suckling piglets were previously vaccinated against Mhyo/PCV2 (VAC1) and PRRSV (attenuated live vaccine). In September 2024, 10% of early finishing pigs showed respiratory distress, high mortality (7%) and marked growth retardation with limited effect to antibiotics. Two pigs (28kg, 31kg) were subjected to post-mortem examination (PME). A standardized slaughter lung assessment (n=170) was also performed. Altered lung (Lu), serum (S) and oral fluid (OF) samples of VAC1 were examined by a combination of various PCR tests for the detection of respiratory pathogens in pigs (IVD 2022). Based on the findings, the producer switched to VAC2. To assess the efficacy of VAC2, slaughter lung assessment was repeated in September 2025 (n=77). Mortality, therapy index and biological performance during fattening were compared between the two groups.

Results

Lab results in VAC1: PME: swIAV (Ct-26), PRRSV-1 (Ct-16, field strain), M.hyo (Ct-22, Lu); PCV2d (Ct-26, lymph nodes). Lu: PRRSV EU (Ct-28), PCV2d (Ct-32), M.hyo (Ct-27). S: PCV2 (Ct-36), PRRSV EU (Ct-31). OF: PCV2 (Ct-27.5), PCV3 (Ct-36). Lung scoring between VAC1 and VAC2 showed decreased bronchopneumonia prevalence (73.83% vs. 36.36%) and EP-index (4.24 vs. 1.75). Performance improvement (VAC2): decreased mortality by 5.3%, increased average daily gain by 129g, as well as reduced antimicrobial use.

Discussion and Conclusion

VAC2 improved respiratory health, reduced antimicrobial use, normalized mortality, ultimately leading to better economic outcomes. However, it must be considered that seasonal effects and other factors influencing management variability might raise the risk of bias when comparing both groups.

IMM-PP-56

COMPARATIVE EFFICACY OF SEVERAL COMMERCIAL MYCOPLASMA HYOPNEUMONIAE VACCINES ON LUNG LESION INCIDENCE AT SLAUGHTER IN SPAIN

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Background and Objectives

Vaccination against Mycoplasma hyopneumoniae (Mh) is essential to reduce bronchopneumonia-like lesion prevalence and severity, and to mitigate the impact of enzootic pneumonia (EP) on growth and feed efficiency. As lung lesions reflect EP incidence, their evaluation at slaughter is a reliable method to assess Mh vaccine efficacy. This study compares the prevalence and severity of EP-like lesions in pigs vaccinated with different commercial Mh vaccines.

Material and Methods

This observational study evaluated randomly 3,171 batches (including 519,735 lungs) across different Spanish farms between 2016 and 2025, using the Ceva Lung Program methodology.
Batches received different one-dose Mh vaccines: monovalent (groups 1–4, H [Hyogen®]) or bivalent PCV2&Mh (groups 5–6).
Lung scoring was performed blindly by trained independent veterinarians. All groups included >100 evaluated batches.
For each batch, the following parameters were calculated: bronchopneumonic lungs (BPL, %) and affected surface of all lungs (ASAL, %).
Statistical comparisons were made using the Kruskal–Wallis test with pairwise comparisons. Significance was set at $p<0.05$.

Results

Vaccine_H showed statistically ($p<0.001$) lower prevalence (BPL 31.57%) and severity (ASAL 1.89%) of lung lesions compared to the group of monovalent (BPL 41.51%; ASAL 3.08) and bivalent vaccines (BPL 45.19%; ASAL 3.67%).
When compared individually, vaccine_H demonstrated significantly ($p<0.001$) lower BPL and ASAL than vaccines 1 (BPL 38.32%; ASAL 2.95%), 3 (BPL 48.25%; ASAL 3.66%), 4 (BPL 43.74%; ASAL 2.96%), 5 (BPL 45.51%; ASAL 3.53%) and 6 (BPL 44.61%; ASAL 3.92%).

Discussion and Conclusion

In the conditions of this study, lungs from pigs vaccinated with Vaccine_H showed lower Ep-like lung lesions than lungs from pigs vaccinated with any other vaccine. Therefore, under these conditions, Vaccine_H showed to be an effective tool in reducing the prevalence and severity of Ep- like lung lesions.

IMM-PP-57

STUDY OF THE HUMORAL IMMUNE RESPONSE IN SOWS AND PIGLETS AFTER VACCINATION AGAINST ROTAVIRUS A

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Background and Objectives

Rotavirus A (RVA) is the most important rotavirus species in swine production, causing neonatal diarrhea. Vaccination can improve production parameters and reduces antimicrobial use. Because most herds are RVA-positive with baseline antibodies, evaluating the immune response induced by Porcilis® Rota is important to confirm correct vaccination practices. This study aimed to evaluate the dynamics of specific antibodies against rotavirus, induced after sow vaccination, and the passive transfer to piglets via lactogenic immunity, using a commercial ELISA in sera

Material and Methods

Forty-five parity-one pregnant sows from a single Danbred genetics gestation unit were selected. Control group (GC): unvaccinated, n = 5. Vaccinated group (GV): n = 40, given Porcilis® Rota with a primary schedule of two doses at 5- and 2-weeks pre-farrowing. Thirty-nine piglets were included (three piglets per sow from 2 sows in GC and 11 sows in GV). The farm was RVA-positive. Blood samples were collected from sows before first vaccination and 15 days after re-vaccination; piglets were sampled 24 hours after birth. Specific anti-RVA antibodies were quantified using the Ingezim ROTAVIRUS PORCINO kit (indirect ELISA), which uses a monoclonal antibody specific for porcine IgG and RVA antigen. Statistical analysis was performed (Kolmogorov-Smirnova, Shapiro-Wilk tests)

Results

Sow antibody values (optical density / ELISA units): after first vaccine dose — GC: 0.611, GV: 1.17 (p = 0.021); at revaccination — GC: 0.612, GV: 2.04 (p=0.018); 15 days after revaccination — GC: 0.64, GV: 1.44 (p=0.069). Within-group comparisons across time points: GC p = 0.573, GV p=0.006. Piglet antibody values: GC: 1.05, GV: 1.54 (p=0.518)

Discussion and Conclusion

RVA vaccination induced significant seroconversion in RVA-vaccinated sows despite baseline seropositivity, an effect not observed in controls. These results support assessment of vaccination practices, confirm successful sow immunization, and enable evaluation of colostrum-derived passive immunity in piglets. Maternal lactogenic immunity after sow vaccination is the primary mechanism for controlling RVA in neonatal piglets

MIS-PP-01

UMBILICAL HERNIA – INVESTIGATION OF TREATMENT METHODS IN A PIG HERD

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Background and Objectives

A new adhesive taping technique for treatment of umbilical hernias was tested in a group of suckling piglets in comparison to a surgery and an untreated control group on a conventional farrow-to-finishing farm with a high prevalence of umbilical hernias.

Material and Methods

In a pilot phase (n = 205) piglets with umbilical hernias were left untreated or were treated by surgery or taping on their fifth day of life. Piglets were examined weekly until weaning. Surgery was performed in anaesthetised pigs by relocation of the closed internal hernia sac into the abdominal cavity and closing the hernia orifice with diagonal sutures. In the taping group a 30 cm long strip of adhesive tape was fixed ventrally in diagonal direction crossing with pressure the hernia orifice. Ends of the adhesive tape were fixed dorsal at the hip bone and caudal the opposite shoulder. In a main study piglets (n=100) were systematically allocated to a non-treated and a taped group according to sex and size of hernia and examined until day 105 of life.

Results

In 50% of the untreated piglets umbilical hernias regressed until weaning without intervention. Surgery resulted in highest mortality and most cases of recurrence (62.5 %) until weaning. In taped piglets only 10% showed still an umbilical hernia after weaning.

Discussion and Conclusion

Although surgery was performed without incidents, highest mortality and recurrence rates occurred in this group. The time point of surgery might have been too early in the first week of life, when tissue was still weak. The taping technique led to lowest recurrence rates and was successfully integrated in routine work as it was performed during castration of piglets.

MIS-PP-02

AUTOMATED SOAKING SYSTEMS: AN EFFICIENT METHOD FOR DETERGENT APPLICATION IN PIG FARMS

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Background and Objectives

The average ATP index is higher in fattening units than in farrowing and post weaning units (Cantaloube, ESPHM 2024). It can be related with the concrete floor and the lack of use of detergent in these buildings. The aim of this study was to compare different methods of detergent application.

Material and Methods

Sixteen rooms (128 pens) from two commercial farms were included. Four cleaning protocols were compared, using the same detergent and identical total quantity:(1) Soaking / Detergent applied with foam gun / Washing;(2) Soaking / Pre-washing / Soaking with detergent / Washing;(3) Soaking with detergent / Washing;(4) Soaking / No detergent / Washing. After washing, three visual scores (IFIP method, Correge 2003) and three ATP measurements per pen were collected. Water consumption and effective working time were recorded per room.

Results

In farm 1, visual cleanliness scores were lower (i.e. better) when detergent was used through automated soaking systems compared with other protocols (1.46 and 1.17 vs. 1.94 and 1.54, $p<0.001$). ATP values were also lower with protocol 3 (6757 RLU vs. 15619, 16510, and 24172 RLU, $p<0.01$). In farm 2, water consumption was reduced when detergent was applied through automated soaking systems (2677–2689 L/100 m²) compared with the foam gun (3075 L/100 m²) or without detergent (3429 L/100 m², $p<0.001$). Effective working time was also shorter with detergent than without (116–123 vs. 144 min/100 m², $p<0.05$).

Discussion and Conclusion

In conclusion, applying detergent through automated soaking systems significantly improves cleaning quality and reduces both water use and working time—by 22% and 19%, respectively. This method appears to be an efficient and practical alternative for improving hygiene management in pig production.

MIS-PP-03

EFFICACY OF INJECTABLE TOLTRAZURIL AGAINST EXPERIMENTALLY INDUCED CYSTOISOSPOROSIS IN PIGLETS: EFFECTS ON PERFORMANCE, INTESTINAL INTEGRITY AND IMMUNE STIMULATION

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Background and Objectives

The purpose of this study was to compare the efficacy Forceris® against Cystoisospora suis after experimental infection in piglets, and its effect on immune stimulation and intestinal integrity, in comparison with an untreated control.

Material and Methods

The study was performed in a parallel, randomised, blinded experimental design comparing the Treatment group (F, 14 piglets) (45 mg of toltrazuril plus 200 mg gleptoferron/piglet) and the Control (C, 14 piglets; 200 mg gleptoferron/piglet) administered on SD2 (3rd day of life: DOL). Experimental infection (1,000 sporulated oocysts/piglet) was performed on the 4th DOL (SD3). Parasitological and clinical parameters were evaluated based on previously published methods (Joachim et al., 2019). Tissue samples (jejunum, ileum and colon) were collected at the end of the study (SD 28) in RNAlater and gene expression for selected cytokines (IL6, IL10, IL12p35, TGF®) and Calprotectin was determined using a previously published method (Ramis et al., 2022).

Results

All parameters related to oocyst excretion, fecal consistency, and weight gain were significantly improved in the toltrazuril-treated group. The control animals shed oocysts for 2.2 days on average and showed diarrhea for an average of 5.5 days. Treatment completely suppressed oocyst excretion except in one piglet, with low shedding (mean AUC for oocyst excretion = 277,5). Significant increases were observed for calprotectin, zonulin and IL6 in the ileum samples of control group, with trend towards a difference in the other biomarkers. A significant increase (p=0.016) of IL12p35 level was observed in colon samples of the control group.

Discussion and Conclusion

Toltrazuril treatment significantly improved performance and eliminated parasite shedding almost completely. Differences observed for biomarkers indicated an increased immune stimulation in the control group, specifically a Th1 activation. Upregulation of zonulin was associated with patent C. suis infection and may correlate with increased intestinal permeability caused by altered genetic expression of intestinal TJ proteins.

MIS-PP-04

CASE REPORT: MYCOPLASMA HYOSYNOVIAE – REDUCING LAMENESS IN FATTENING PIGS AFTER INTRODUCTION OF AN AUTOGENOUS VACCINE

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Background and Objectives

Mycoplasma hyosynoviae is a common bacterium of the upper respiratory tract. In cases of systemic dissemination, the pathogen may invade joints, which can result in acute lameness. Risk factors for systemic spread are still unknown, but arthritis occurs especially in fattening pigs. Antibiotic treatment is the most common and effective strategy.
In summer 2023, an increased number of acute lame pigs occurred predominantly between the 6th and 8th week of the fattening period in a pig holding keeping 12,000 fattening pigs. Trembling in the hind legs was observed, along with unsuccessful attempts when standing up and sitting on one side suspecting a Mycoplasma hyosynoviae infection. Aim of investigation was improvement of animal health by isolation of Mycoplasma hyosynoviae and production of an autogenous vaccine.

Material and Methods

Improvement of animal health included two steps: first, farm workers were schooled in identification and treatment of sick pigs once a week during stock visits. Acute lame pigs were treated with Lincomycinhydrochlorid – Monohydrat and Meloxicam three times. In addition, a weekly survey of clinically sick and treated pigs was conducted. Second, three untreated animals with typical clinical symptoms were euthanized for pathological investigation.

Results

Acute lameness was improved by antibiotic treatment. Pathological examination revealed serosanguinous arthritis in both knee and tarsal joints. Mycoplasma hyosynoviae was detected using molecular biological methods and isolated by bacteriological culture. Due to a two-shot vaccination (first and fourth week of fattening) of Mycoplasma hyosynoviae autogenous vaccine morbidity decreased from 11% to 3%.

Discussion and Conclusion

Advantages for this herd using the autogenous vaccine include: first animal welfare improvement, second decrease of antimicrobial usage and third reduction of workload involving treatment of diseased pigs. Consequently, the use of an autogenous Mycoplasma hyosynoviae vaccine can be a useful tool to improve animal health in infected herds. However, the mechanism of action of the autogenous vaccine is not fully understood yet.

MIS-PP-05

INTER-LABORATORY AGREEMENT IN QUANTIFYING BACTERIAL LOAD OF LAWSONIA INTRACELLULARIS AND BRACHYSPIRA PILOSICOLI USING QUANTITATIVE PCR

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Background and Objectives

Diagnostic analyses are an important tool for optimizing HERD HEALTH MANAGEMENT AND ECONOMY and familiarity with the different analyses is essential for correct interpretation of results. A ring-trial was performed to evaluate the inter-laboratory agreement in quantifying the fecal bacterial load of Lawsonia intracellularis (LI) and Brachyspira pilosicoli (BP) in grower pigs using quantitative PCR (qPCR).

Material and Methods

Twenty-eight pooled fecal samples were collected from end-nursery pigs in 28 different farms. Upon collection, each fecal sample was thoroughly mixed and divided into two identical subsamples analyzed in parallel by two laboratories: MSD Animal Health R&D Service Laboratory, The Netherlands (CDS), and Danish Pig Research Centre, Denmark (Kjellerup).
At CDS, LI was quantified using the BactoReal® Kit Lawsonia intracellularis (Ingenetix), with results reported as $\log_{10}$ DNA copies/µL of fecal solute. The quantification range for this assay was 1.0 to 6.3 $\log_{10}$ copies/µL. BP was analyzed using the Kylt®BRA kit (SAN Group Biotech, Germany), with results expressed in quantification cycle (Cq) values ranging from 0 to 40.
At Kjellerup, in-house-tests were used for both LI and BP and qPCR results were expressed as DNA copies per gram of feces that subsequently were transformed to $\log_{10}$ copies/gram for comparison.

Results

Analysis revealed a strong agreement between laboratories for both pathogens. The Pearson correlation coefficient for LI was 0.980 ($p < 0.001$, two-tailed), indicating excellent concordance. For BP, the correlation coefficient was -0.973 ($p < 0.001$, two-tailed), reflecting the expected inverse relationship between DNA copies and Cq-values.

Discussion and Conclusion

These results demonstrate high inter-laboratory consistency in qPCR-based quantification of LI and BP in porcine fecal samples, supporting the robustness and comparability of the diagnostic methodologies used. However, it also highlights the importance of familiarity with the analysis used when interpreting the significance of a given laboratory result as values needs to be translated accordingly.

MIS-PP-06

ACIDIFICATION OF DRINKING WATER AND STIFFNESS IN FATTENERS: IS THERE A RELATION?

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Background and Objectives

Different strategies are implemented to improve pig health in different stages of rearing. But what if these strategies interfere? A recent case in fast growing finishers raised the question whether acidification of drinking water influenced stiffness in fatteners.

Material and Methods

In a farm stiffness occurred in the first week in the fattening stable. Fatteners were fed pelleted feed and acidified drinking water supplied by nipples in the trough. Serum was collected from ten fatteners with stiffness (group 1.S) and ten without (group 1.N). Individual samples were analyzed for calcium and phosphate. Osteocalcin and CTx were determined but in pools of five samples. After three months acidification was stopped. The stiffness in the fatteners disappeared. Again ten serum samples were collected and analyzed (group 2). For statistics an unpaired T-test was performed.

Results

For Osteocalcin lower values were detected in group 1.S compared to group 1.N and group 2. CTx was detected in group 1.S only, in group 1.N and group 2 it was below the limit of detection. Group 1.S had lower Calcium concentrations then group 1.N. Group 2 had the highest Calcium concentrations, compared to other groups ($p < 0,01$). For phosphate there was no significant difference between 1.S and 1.N, but both groups were higher than group 2.

Discussion and Conclusion

The Osteocalcin:CTx ratio suggests that the bone remodeling process shifted more towards bone resorption in group 1.S. The concentration of calcium is lower in group 1.S, although there is extra Calcium resorption from the bones. This leaves a problem with the uptake or extra loss. The highest calcium-concentrations were found in group 2, which could point to an influence of acidification of drinking water on calcium uptake in fast growing pigs. More research is needed to further clarify these findings.

MIS-PP-07

REPRODUCTIVE CONSEQUENCES OF PCV2D INFECTION AND IMPACT OF CIRCOVAC® IMPLEMENTATION IN ONE FRENCH SOW HERD

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Background and Objectives

Porcine Circovirus type 2 (PCV2) is a ubiquitous virus responsible for several PCV2-associated disorders such as stillbirths, mumification, embryonic death and infertility (SMEDI). The PCV2d genotype is currently the predominant strain in France. The aim of this paper is to describe the clinical consequences of PCV2d infection in one farm, its impact on reproductive parameters and the changes after vaccine implementation.

Material and Methods

The case occurred in a farrow-to-finish 320 sow farm. The observed clinical signs were observed in gilts and primiparous sows and included an excessive number of mummies (Mu) and reduced fertility. PCV2d infection was diagnosed in February 2025 on mummified piglets born from two primiparous sows. The gilts were theoretically vaccinated in quarantine with an inactivated PCV2a whole virus vaccine, but a farm visit revealed that they were only receiving one vaccine shot instead of the two vaccine shots within an interval of three weeks like Summary of Product Characteristics (SPC) recommendations. After the mistake's discovery, all the gilts and primiparous sows received simultaneously a new primary vaccination. The farm productivity criteria concerning this category of reproductive animals were compared between two periods: "Before" PCV2d detection (from September 2024 to February 2025) and "After" onset of vaccine immunity (from July to September 2025).

Results

From the Before period to the After period, the average of Mu per litter significantly reduced from 1.86 to 0.4 (Khi^2 test; $p<0.01$); the average of total of born piglets including Mu increased from 15.75 to 17.16 piglets and the fertility rate increased from 78.4% to 81.4%.

Discussion and Conclusion

This case demonstrates the high impact of an PCV2d infection on incorrectly vaccinated gilts and primiparous sows' productivity parameters. The implementation of Circovac® according to SPC recommendations succeeded to reduce SMEDI syndrome.

MIS-PP-08

PRACTICAL TRIAL: IMPACT OF STORAGE TEMPERATURE ON SWINE INFLUENZA VIRUS DETECTION AND SUBTYPING IN ORAL FLUID SAMPLES

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Background and Objectives

Influenza viruses pose a significant health threat to swine and humans, making regular herd monitoring essential. Non-invasive oral fluid sampling offers a practical solution, but saliva's enzymatic content can cause degradation, affecting virus detection. This study evaluated how different storage temperatures influence detection and subtyping of swine influenza virus (SIV) in oral fluid samples.

Material and Methods

Six oral fluid samples collected from German pig farms were delivered within one day to the SAN Group Biotech Germany laboratory. After thorough mixing, one aliquot underwent immediate screening PCR for SIV (Kylt® IVA beta RTU), while the remainder was divided into three storage conditions: room temperature (approx. 20°C), refrigerator temperature (approx. 7°C), and freezer temperature (approx. -18°C). Room temperature samples were tested after 1, 4, and 7 days; those at 7°C after 1, 4, 7, and 14 days; and at -18°C after 4, 7, 14, and 28 days. On each designated day, screening PCR was repeated, and on day 28, positive samples were further subtyped (different kits).

Results

Out of six samples, four were SIV-positive by PCR upon arrival (Ct values 27.0–30.8) and stored as described. In the further course the positive samples stored at 7°C and -18°C showed positive results across all testing points. In contrast, those at 20°C were reliably positive only on days 1 and 4; by day 7, half of these samples failed to produce positive results. Successful SIV subtyping after 28 days was achieved for all samples stored at -18°C.

Discussion and Conclusion

In summary, this practical trial demonstrates that prolonged storage of swine oral fluid samples can maintain detection rates even without stabilizers, provided samples are stored at 7°C or -18°C. For longer-term storage, avoiding room temperature is advised. Further research with a larger sample size is recommended.

MIS-PP-09

USE OF TREE FUNGI AS POTENTIAL BENEFICIAL FEED ADDITIVE FOR PIGLETS WITH POST-WEANING DIARRHOEA

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Background and Objectives

Tree fungi, such as birch polypore, have been used in traditional medicine for gastrointestinal disorders of humans but are underexplored in veterinary medicine. The present study investigated the effect of birch polypore to stabilize the gut homeostasis in weaned piglets.

Material and Methods

Thirty-two piglets were divided into two groups at weaning: treatment group (birch polypore) and control. The trial lasted three weeks. Gut homeostasis was destabilized by feeding a diet containing 3% carboxymethylcellulose during the first two weeks. From study day 7 onwards, the decoction was orally administered twice daily to the treatment group, and physiological saline to the control. In the 3rd week, the administration of the decoction was discontinued to investigate the longer-term effects of the decoction. At the end of the 2nd and 3rd week, half of the piglets (n=8/group) were euthanized to obtain blood and gastrointestinal samples.

Results

After 7-days of administration, the birch polypore increased beneficial Lactobacillaceae in gastric and caecal digesta, while reducing the jejunal expression of pattern recognition receptors ($P < 0.05$) and, as trend, signalling via NF-kappa B. The decoction further tended to enhance caecal butyrate. Serum C-reactive protein tended to be lower in piglets receiving the decoction compared to the placebo. Most of these effects continued after the discontinuation of the administration of the decoction. Additionally, pathobionts like Clostridium sensu stricto became less abundant in the treatment group compared to the control in the 3rd week. Administration of the decoction on jejunal tissue in Ussing chambers reduced transepithelial tissue conductance, indicating improved gut integrity.

Discussion and Conclusion

Birch polypore decoction shows potential as a natural feed additive to improve gut health, reduce inflammation, and mitigate post-weaning diarrhoea in piglets. Its modulation of the gut microbiome and metabolites supports gastrointestinal homeostasis, offering a sustainable alternative to zinc oxide and antibiotics.

MIS-PP-10

PROLAPSES IN SOWS: RELATIONSHIP WITH OTHER MACROSCOPIC LESIONS FOUND DURING NECROPSY?

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Background and Objectives

The increase in all types of prolapse in sows has been notable in recent years in different countries, contributing to higher mortality rates. Our objective was to determine whether there was a relationship with other macroscopic lesions after performing necropsies on sows that were removed for this reason.

Material and Methods

In a system with 9,000 sows in south-eastern Spain, a farm necropsy was performed on 44 sows that had been removed, in which operators registered some type of prolapse as the main cause (Nov' 24-Aug'25).

Results

Of the 44 sows in the study, 59.1% were culled and 40.9% died on the farm. 53.2% had uterine prolapse, 31.8% rectal, 11.4% uterine and rectal, 2.3% bladder, and another 2.3% uterine and bladder. Of the total, only 12.9% had no other obvious lesions found at necropsy. Among the findings, in 25.8% of cases, the stomach was full of gas and food, presenting with severe dilation (34.3% in uterine prolapses), 8.1% had cystitis (8.6% uterine and 10.5% rectal prolapse), 8.1% had some type of lameness injury (21.1% in rectal prolapses), 6.5% had gas and distension of the intestinal loops or some type of pneumonia (8.6% in uterine prolapses), 4.8% were cachectic animals, all with rectal prolapse (15.8%), Intestinal torsion was present in 3.2% of the total (2.9% uterine and 5.3% rectal). The remaining findings were present in only one animal of the total (1.6%).

Discussion and Conclusion

In this case, only 12.9% showed no further lesions at necropsy, so we should investigate whether or not the lesions are related to the prolapse. In this regard, more than 25% had stomach dilation, which may lead us to believe that intra-abdominal pressure may be of great importance in the development of prolapse. Further research is needed, as well as necropsies that do not skew the information on sow mortality.

MIS-PP-11

STUDY OF INTESTINAL INTEGRITY IN ANIMALS WITH PERIWEANING FAILURE TO THRIVE SYNDROME (PFTS)

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Background and Objectives

The integrity of tight junctions and gastrointestinal function can be affected by inflammatory processes. The evaluation of the intestinal immune barrier is crucial. Periweaning failure to thrive syndrome (PFTS) is a multifactorial disease. Affected piglets exhibit growth retardation, weakness, and, among other lesions: fundic gastritis, villous atrophy in the small intestine, and superficial colitis.The objective of this research was to evaluate the intestinal structure and functionality in the jejunum and ileum in by studying the gene expression of tight junction proteins as well as intestinal immune activation by expressing inflammatory and pro-inflammatory cytokines in piglets with PFTS.

Material and Methods

Samples of jejunum and ileum were taken from 60 piglets (30 healthy;H and 30 diseased; D). Gene expression was studied for Occludin (OCL), Zonulin 1 (ZON), Claudin (CLA), Calprotectin (CAL), IL1◊, IL1®, IL6, IL8, IL12p35, IL12p40, IFN◊, IFN©, TNF◊, TGF® and IL10. The results were normalized using the Livack method and using both disease status (healthy vs. diseased) and histological degree of thymus atrophy (normal, atrophied, severely atrophied) as controls.

Results

There was no difference in any biomarker when comparing healthy vs. clinically ill individuals. However, when using the degree of atrophy as a normalizer, differences were observed in the jejunum for CLAU, IFN◊, IL12p40, IL1 ®, TNF◊, IFN◊, and TGF®, and a trend for IL1◊, IL10, OCL, ZON and IL6, all of which were hypoexpressed in animals with severely atrophied thymus compared to animals with atrophied and normal thymus.

Discussion and Conclusion

This study sought to establish the relationship between thymus atrophy and intestinal immunity, with a clear decrease in cytokine gene expression in the jejunum but not in the ileum. The results suggest that a lack of available lymphocytes leads to decreased activity in the jejunum.

MIS-PP-12

ESSENTIAL OILS IN DRINKING WATER OF SOWS SIGNIFICANTLY IMPROVED PIGLET PERFORMANCE

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Background and Objectives

Essential oils and menthol provide antimicrobial and respiratory benefits that may enhance sow resilience during lactation. As maternal stress influences litter outcomes, targeted supplementation could improve performance. This study evaluated the effects of administering an essential oil blend (EO) in sow drinking water on litter performance.

Material and Methods

The trial was conducted on a commercial farm in Brazil with 30 DanBred sows (Ø parity 3) over 7 days pre-partum and 23 days of lactation. Sows were housed in individual pens; litters received milk replacer from day 5 and pre-starter feed from day 10. A randomized block design (by parity) compared an essential-oil treatment (EO50: 50 ml/ 1000 L water, 5 h/ day; Eucalyptus globulus, Mentha arvensis, menthol) with a control (CON), 15 replicates each. Parameters included sow average-daily-feed-intake (ADFI) and feed-conversion-ratio (FCR), piglet individual weight (PIW), litter weight (LW), daily weight gain (DWG), and mortality. Data were tested for normality and analysed using one-way ANOVA or Mann–Whitney U test; significance was set at P δ 0.05.

Results

Sow ADFI and FCR during lactation was numerically increased in the treatment group. At day 10, PIW, LW, and DWG showed significant differences (p δ 0.05). By day 23, a significant increase in number of weaned piglets (p δ 0.05) was observed, driven by reduced mortality (6.41% vs. 1.99%), indicating enhanced growth performance and piglet survival.

Discussion and Conclusion

Eucalyptus and mint extracts have demonstrated performance benefits in livestock. Their use in swine shows potential, although mechanisms require further investigation. In this trial, the water supplemented essential oils and menthol increased feed intake, significantly improved piglet weaning weights and pre-weaning mortality. These findings indicate that such supplementation can improve piglet performance and survival, offering a practical strategy to enhance overall herd productivity.

MIS-PP-13

SUSPECTED TYPE III POST-VACCINATION LEUKOCYTOCLASTIC VASCULITIS IN TWO SOWS

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Background and Objectives

In humans, type III hypersensitivity can cause cutaneous vasculitis following vaccination.
This case report aims to describe the investigations of two clinical cases of sows' cutaneous vasculitis observed after vaccination.

Material and Methods

The case farm is a 600 sows farrow-to-finish French farm regularly controlled as PRRSV stable with sow vaccination and vaccinated against PCV2. Two sows developed red to purple macules localised on the udder, the flanks and the hind limbs five months apart. The lesions appeared two days after a vaccination for the first sow (parity 5) and three days after the last vaccination for the second sow (parity 8).
Biochemistry, CBC, PCR, IHC, serology, histology, gram staining and IF were implemented to identify the cause of skin lesions. IF was used to detect immune complexes and complement deposition for the diagnosis of type III hypersensitivity.

Results

Clinical examinations, herd visit, and technical results analysis revealed no abnormalities.
Both biochemistries showed hypercreatininemia, hyperproteinemia, hyperalbuminemia with normal uremia.
Hematology showed an increase in lymphocytes levels for sow 1.
All PCR PCV2, PCV3 and PRRS on serum and IHC PCV2 conducted on skin biopsies were negative. Both sows were seropositive for PCV2.
Histopathology demonstrated necrotizing and leukocytoclastic vasculitis.
Skin biopsie GRAM staining showed no bacteria.
IF failed to detect any signal with the antibodies used.

Discussion and Conclusion

Type III hypersensitivity can't be excluded because immune complexes are transient and biopsies were made approximately 48 hours after skin lesions appeared. Moreover, little is known about the sensitivity and specificity of IF in pig. Investigations fit with a vaccine adverse effect, although cutaneous vasculitis is not described as an adverse effect of any vaccines used in this farm. Cutaneous vasculitis has already been described after human vaccination (Varicella-Zoster, influenza and COVID-19 vaccination). Therefore, vaccine side effect should be integrated in the differential diagnosis of swine cutaneous vasculitis.

MIS-PP-14

DEVELOPMENT OF A PORCINE SALIVARY GLAND ORGANOID MODEL FOR POTENTIAL USE IN STRUCTURAL AND FUNCTIONAL IN VITRO STUDIES

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Background and Objectives

Porcine salivary glands play a key role in digestion, mucosal protection, immune signaling, and oral homeostasis. However, the lack of advanced in vitro models limits the study of glandular physiology, pathogen interactions, and biomarker discovery in pigs. The objective of this work was to establish a reproducible protocol to generate tissue-derived porcine salivary gland organoids that retain key epithelial features such as secretory-like structures, providing the foundation for future mechanistic and translational studies in porcine health management

Material and Methods

Submandibular salivary gland tissue from a healthy male pig obtained at the slaughterhouse was mechanically minced to isolate tissue clusters. The resulting fragments were cultured in a defined 3D medium optimized to support epithelial expansion and were passaged multiple times. Brightfield imaging was used to document the morphological development of the organoids over time. To evaluate structural organization, organoids were fixed, paraffin-embedded, sectioned, and stained with hematoxylin and eosin. Histological features were compared with those of native salivary gland tissue

Results

Porcine salivary gland cells successfully formed stable organoids that expanded over passages. Brightfield analysis revealed spherical epithelial structures with dense cellular organization. Histologically, organoids were composed of occasionally polarized, predominantly cuboidal epithelial cells, with multiple lumens and occasional secretory material, resembling ductal-like architecture based on H&E, similar to the native tissue. The model proved robust for passaging and maintenance of morphological integrity during culture

Discussion and Conclusion

This work demonstrates the feasibility of generating porcine salivary gland organoids that structurally resemble portions of the tissue of origin, supporting their potential as a novel in vitro platform for porcine physiology research. With additional characterization and functional assessments, these organoids could offer promising applications for studying mucin secretion, glandular development, susceptibility to infectious diseases, and biomarker secretion. Additional characterization and functional evaluations are needed to further validate this model and support its future use in porcine health and biomarker research.

MIS-PP-15

UNDERSTANDING ITALIAN WORKFORCE DYNAMICS TO GUIDE THE DEVELOPMENT OF THE NEXT-GENERATION SWINE FARMING

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Background and Objectives

Across Europe, a decline in farm veterinarians has been reported by the Federation of Veterinarians of Europe. This trend has been attributed to several factors, including ethical conflicts between animal welfare, medical decisions, and economic constraints of clients, as well as increasing public criticism toward intensive farming systems. This study aimed to investigate drivers and obstacles influencing swine veterinarians' decision to remain in or exit the pig sector, and to identify which features these professionals would prioritize in the transition toward a "next-generation farm" (NGF), designed to be more sustainable not only from a technical and economic perspective, but also in social terms.

Material and Methods

The questionnaire consisted of two sections: a free association task to elicit veterinarians' spontaneous representations of their professional role, and a multiple-response ranking exercise in which respondents prioritized predefined features of an ideal NGF. The survey was administered to 87 swine veterinarians from different categories (practitioners, official veterinarians and industries) and ages at the annual Italian meeting of the Swine Pathology and Management Society. The first section of the questionnaire was analysed by a thematic analysis, while the second one through a quantitative approach using the Borda score.

Results

Words used to describe the profession of swine veterinarians were grouped into motivation (30%), harshness (16%), and characterization (54%). Younger (<39 years) veterinarians placed more importance on working conditions, such as air quality, reasonable working hours, and comfort of work and rest areas, while older ones prioritized technical aspects, e.g. biosecurity.

Discussion and Conclusion

Results indicate that scientific expertise is highly valued across respondents, while the profession's challenging aspects are uniformly perceived. Younger veterinarians expressed a stronger need for everyday innovation (better working spaces, air quality, schedules) highlighting the importance of personal sustainability. Thus, next-generation farms should prioritise well-being, work–life balance, and professional development to retain swine veterinarians in the sector.

MIS-PP-16

ASSOCIATION BETWEEN ROTAVIRUS A LOAD AND POST-WEANING DIARRHEA IN COMMERCIAL PIG FARMS

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Background and Objectives

Rotavirus A is an enteric pathogen whose constant circulation on farms makes it a relevant agent in the health dynamics of piglets. In this context, Rotavirus A may act as a potential trigger of post-weaning diarrhea, contributing to alterations in the intestinal microbiota and increasing susceptibility to infections, such as post-weaning colibacillosis. The aim of this study was to evaluate fecal shedding of Rotavirus A in farms with different incidence of post-weaning diarrhea.

Material and Methods

Fourteen commercial farms were sampled (none of them had implemented vaccination against Rotavirus A), recording in each farm the percentage of piglets affected by diarrhea. This percentage ranged from 0 to 50%, depending on the farm, and each farm was subsequently classified into the corresponding level (low, medium, high) according to the tercile. Rectal swabs were collected from 9 to 21 weaned piglets per farm and analyzed by qPCR for Rotavirus A and the E. coli virulence factors: STa, STb, LT, F4, and F18. Comparisons of Rotavirus A levels between terciles were performed using logistic regression.

Results

Circulation of both pathogens was detected in all farms, although regarding E. coli, F4 was not detected in three farms, and LT and STa were not detected in two farms. Regarding Rotavirus A load, as the incidence of diarrhea increased, a decrease in Cq values by qPCR was observed, which was significant between the groups with the highest and lowest incidence ($p < 0.05$), with a mean difference of 8.5 Cq.

Discussion and Conclusion

The large mean difference in Cq between the low- and high-incidence groups supports the hypothesis that Rotavirus A infection contributes directly to the onset and severity of post-weaning diarrhea. This suggests that viral load could serve as a risk indicator, and that piglets with higher fecal shedding are likely more susceptible to intestinal disturbances and secondary infections, such as colibacillosis.

MIS-PP-17

LYMPHOID NEOPLASMS IN PIGS: MORPHOLOGICAL AND IMMUNOPHENOTYPIC CLASSIFICATION IN A 10-YEAR RETROSPECTIVE STUDY

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Background and Objectives

Porcine lymphomas are uncommon yet among the most frequently diagnosed neoplasms in this species. However, information regarding their morphological variation and immunophenotypic profiles remains limited. This study retrospectively characterizes lymphomas by evaluating their morphological features and determining immunophenotype and proliferation indices.

Material and Methods

Cases were retrospectively collected from archives over 10 years, including full necropsies and slaughterhouse tissue submissions. All cases were re-evaluated histologically and classified according to WHO criteria adapted for domestic animals. Immunophenotyping was performed using CD20 and CD3 immunohistochemistry. In selected cases, Ki-67 immunostaining was used to determine the proliferative index, which was quantified morphometrically to assess correlation with histological grade.

Results

A total of 43 lymphoid neoplasms were identified. Lymph nodes—particularly cervical and thoracic—were most frequently affected, with additional involvement of kidney, liver, and spleen. Immunophenotyping revealed 24 cases (56%) of B-cell lineage and 19 cases (44%) of T-cell lineage. Diffuse large B-cell lymphoma, centroblastic type, was the predominant B-cell subtype, while unspecified peripheral T-cell lymphoma, was the most common T-cell subtype. Morphometric Ki-67 assessment showed variable proliferation indices across high-, medium-, and low-grade lymphomas, with higher expression in high-grade and lower expression in low-grade cases, respectively. No significant differences were observed between the different lymphocytic lineages.

Discussion and Conclusion

This study demonstrates that porcine lymphomas encompass distinct morphological and immunophenotypic entities. As lymphoid neoplasms in swine are infrequently reported and often insufficiently characterized, standardized classification improves diagnostic accuracy and provides valuable data for a species where neoplastic conditions remain underrecognized, contributing to a better understanding of lymphoid tumor biology in pigs. Practically, these findings assist veterinarians in differential diagnosis; recognizing lymphoma as a potential cause of lymphadenopathy or organ enlargement helps avoid misinterpretation as infectious disease. Furthermore, standardized classification generates epidemiological data for surveillance and future research in swine populations.

MIS-PP-18

RESPONSE OF RESPIRATORY HEALTH PARAMETERS TO CHANGES IN FARM MYCOPLASMA HYOPNEUMONIAE VACCINATION

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Background and Objectives

Single farming operation with 3300 sows. PRRS positive (vaccinated, stable) and Mycoplasma hyopneumoniae (MH) positive health status. Approximately 100,000 pigs weaned per annum, 50% of which are reared to slaughter within the operation via Site one and Site two. A 'two-shot' approach to MH vaccination was administered, using Suvaxyn MH-One (Zoetis) at weaning and 40kg. An enforced switch of MH vaccine occurred in Spring 2025 for 3 months due to supply disruption, during which time an alternative MH vaccine was used following existing vaccination protocols.This case report describes the response of 'EP-like' lesions recorded during abattoir health monitoring over the period of enforced changes in vaccination protocols.

Material and Methods

Lung consolidation ('EP- like' lesions) was assessed using the modified Goodwin methodology (Score 0 – 55). EP-like lesion data from April – November 2025 for Site One and Two were analysed using Chi-Squared, Minitab.

Results

Pigs vaccinated with a 'two-shot' MH-One protocol had significantly lower lung scores compared with those vaccinated with the two-shot alternative MH vaccine ($P < 0.05$). Mean lung scores for Site One from MH-One vaccinated pigs were 1.04 (StDev 3.11, min 0 - max 38) and from alternative vaccine were 4.38 (StDev 7.63, min 0 – max 42). Mean lung scores for Site Two from MH-One vaccinated pigs were 0.63 (StDev 1.55, min 0 - max 11) and from alternative vaccine were 3.66 (StDev 5.32, min 0 – max 23). Pleurisy scores also increased over the same period.

Discussion and Conclusion

These farms had operated a successful MH control programme. Key respiratory parameters observed at slaughter deteriorated for pigs which received an alternative MH vaccine. On this farm, a '2 shot' approach using Suvaxyn MH-One produced good MH control. Matching vaccine choice and regimen to specific farms is important in achieving effective MH control. Vaccine supply interruption can substantially destabilise herd health, even when similar alternative strategies are implemented.

MIS-PP-19

INTEGRATION OF GENERATIVE ARTIFICIAL INTELLIGENCE IN VETERINARY EDUCATION: EVALUATION OF MICROSOFT COPILOT IN A CROSSOVER STUDY

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Background and Objectives

The increasing digitalization of higher education offers new opportunities to enhance clinical reasoning in veterinary medicine. The project 'Dr. med. vet. KI' investigated the integration of generative Artificial Intelligence (AI) as a didactic tool to support veterinary students in problem-oriented case analysis, focusing on Microsoft Copilot as the selected AI product.

Material and Methods

Following a systematic evaluation of multiple AI tools, Microsoft Copilot was identified as most suitable for academic use due to its accessibility, functionality, and data protection compliance. A user-oriented 'Cheat Sheet' and a targeted prompt were developed to facilitate practical application. A crossover study was conducted within the course 'Leitsymptome' at the University of Bern, involving approximately 60 fourth-year veterinary students and four lecturers. Participants were randomly grouped into AI-assisted and traditional case-solving conditions. The grouping process was conducted blindly to the course instructor to prevent bias. Quantitative and qualitative data were collected through student surveys and lecturer evaluations.

Results

Thirty-eight student responses indicated that 68% gained relevant insights from AI-generated suggestions, although the overall learning experience was rated as moderate. Lecturers' evaluations of case presentations revealed no statistically significant performance difference between AI-assisted and non-AI groups ($p = 0.464$). Feedback noted benefits like structured information retrieval and reflective thinking, but also drawbacks such as superficial AI output and reduced independent reasoning.

Discussion and Conclusion

The integration of AI in veterinary education offers potential for enhancing structured problem-solving and reflection but does not automatically improve learning outcomes. Didactic guidance, critical evaluation of AI-generated content, and awareness of ethical and data protection issues are essential for responsible use. Future studies should employ larger, standardized cohorts to further evaluate the long-term impact of AI-assisted learning on competence development.

MIS-PP-20

PREVALENCE OF CYSTOISOSPORA SUIS IN PIG FARMS IN ARGENTINA

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Background and Objectives

Porcine neonatal coccidiosis is a parasitic enteropathy caused by Cystoisospora suis, considered the most common intestinal protozoan in intensive pig production systems worldwide. The objective of this study was to determine the prevalence of Cystoisospora suis in suckling piglets on farms in Argentina.

Material and Methods

The study was conducted between December 2024 and September 2025. A total of 196 litters from 19 farms located in different provinces of Argentina were analyzed: Buenos Aires (9), Córdoba (5), Santa Fe (1), Río Negro (1), La Rioja (1), and Neuquén (1), representing more than 10% of the sows housed in intensive production systems in Argentina. The size of the farms ranged from 250 to 7,000 sows, and all operated under intensive production systems with total confinement. Ten percent of piglet litters were sampled at 9 and 12 days of age (first sampling) and repeated the same piglets at 16 and 21 days of age, according to the protocol of Joachim et al.

Results

57.9% of the farms (11/19) and 44.9% of the litters (88/196) were positive for Cystoisospora suis. Almost half of the sampled litters presented oocysts in the feces, regardless of the presence of clinical signs. This finding demonstrates a high subclinical circulation of the parasite in the intensive systems studied.

Discussion and Conclusion

The results of this study confirm that Cystoisospora suis is widely distributed in confined pig production systems in Argentina. The prevalence of 57.9% of positive farms and 44.9% of positive litters demonstrates endemic circulation of the parasite in the evaluated farrowing facilities, with values like those reported in international studies conducted in intensive systems. The results obtained in this study constitute the first national survey of Cystoisospora suis prevalence in confined systems in Argentina, providing updated evidence on the magnitude of the infection in technologically advanced establishments.

MIS-PP-21

COMPARATIVE EFFICACY OF PRODUCTS CONTAIN TOLTRAZURIL AND GLEPTOFERRON IN PREVENTION ANEMIA AND DIARRHEA CAUSED BY CYSTOISOSPORA SUIS

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Background and Objectives

Products combined with toltrazuril and gleptoferron were used to control piglet diarrhea caused by Cystoisospora suis and prevent anemia due to iron deficiency. This study aims to compare the efficacy and safety of the 2 products available in Vietnam. Piglet performance and antibiotic use were also measured.

Material and Methods

The trial was conducted on a commercial pig farm in Vietnam, where Cystoisospora suis infection and neonatal anemia had been previously reported. Piglets from 30 clinically healthy sows were randomly distributed into Forceris®) group (F, n=124) and a copy product (C1, n=115). Both products contain 45 mg toltrazuril and 200 mg gleptoferron and was injected (1.5ml, IM) into piglets on day 3 of age. Cystoisospora suis was evaluated from feces using flotation and Mc Master. Hemoglobin was measured using HemoCue® Hb 201+ and defined clinical anemia (Hb < 90 g/L), subclinical anemia (Hb: 90–110 g/L), and normal (Hb > 110 g/L). Weights were recorded before the intervention and at weaning day. Total antibiotic use was calculated.

Results

Group F had a significantly lower percentage of clinical anemia (4.17%) compared to that of C1 (39.1%) (p=0.004). Piglets in group F had less severe diarrhea cases (score 4) compared to group C1 (p=0.03). The rate of oocyst-positive samples and mean OPG showed no significant difference between the groups (p>0.05). There was no case of side effects among the tested animals. Group F improved piglet weight (500g/pig) compared to group C1 (p=0.019). The percentage of mortality in group F (6.45%) decreased by half that of C1 (11.3%). Lower amount of antibiotic was used in group F (46 mg /piglet versus 58.7 mg /piglet) compared to group C1.

Discussion and Conclusion

Product F has better efficacy to control diarrhea, prevent anemia, improved weight gain and reduce antibiotic usage than the copy product.

MIS-PP-23

HEPATIC LIPIDOSIS IN PIGS DIAGNOSED IN TWO SUBMISSIONS TO THE GREAT BRITAIN (GB) SCANNING SURVEILLANCE NETWORK

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Background and Objectives

Hepatic lipidosis in pigs is rarely described in literature, but may be under-reported (Alsop et al., 1994; https://www.aasv.org/shap/issues/v2n2/v2n2p5.pdf). APHA had no recorded diagnoses of hepatic lipidosis in pigs until August 2025, when two diagnoses were made from unlinked submissions.

Material and Methods

Submissions were for voluntary, Government-subsidised diagnostic testing, through the GB scanning surveillance network. Investigations involved clinical history taking, post-mortem examinations (PME), bacteriology and histopathology.

Results

Both cases were from indoor breeding herds. In case 1, gilts demonstrated anorexia following a suspected feed issue. Anorexia/reduced feed intake resolved in all but 12 affected pigs following removal of a specific feed component. In case 2, recumbency was described among gilts that entered the herd 4-7 weeks into gestation in excessive body condition and poor conformation. Bacterial polyarthritis was diagnosed in one pig. PME of gilts from both cases (two from case 1 and one from case 2) revealed ulceration of the pars oesophagea, with no/very little gastrointestinal tract contents and marked pallor of livers and kidneys. These pigs were in late gestation with large litters (17-20 piglets each) and had diminished body condition. Histopathology revealed marked lipid accumulation in hepatocytes and renal tubular epithelium.

Discussion and Conclusion

Hepatic lipidosis is an unusual outcome of rapid loss of body condition in pigs; Alsop et al. (1994) describe one case study in a sow in late gestation with gastric ulceration where ketosis was also identified. In the current cases, interrupted feed intake may have exacerbated the demands of late gestation, large litter sizes and continued growth of gilts, leading to severe energy deficits. This likely led to mobilisation of fat stores, hyperlipaemia and hepatic and renal lipidosis. APHA invites others' thoughts and experiences, particularly if similar pathology has been encountered.

MIS-PP-25

INDIVIDUAL TRACEABILITY AS A DECISION-MAKING TOOL ON FARMS

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Background and Objectives

Individual swine productivity data is key for optimizing performance, detecting potential early health issues and enabling precise veterinary interventions. LeeO® is a traceability system, integrating RFID technology and cloud-based data management for individual animal monitoring from birth to harvest. The objective of the study was to evaluate productive parameters on a commercial farm assisted by the data recording with LeeO® traceability to try to improve data beyond the company's objectives

Material and Methods

650 piglets were selected at birth from a 2,500-sow DanBred herd and randomized within same farrowing batches by sex, sow parity, viability and birth weight. Piglets received ultra-high-frequency (UHF) ear tags and data were recorded in LeeO®. Individual weights were taken at birth (BW), weaning (WW) (27 days) and pre-slaughter at 26 weeks (FW) using the LeeO® scale. Collected data underwent production performance and statistical analysis

Results

BW correlates moderately with WW (r=0.44) and weakly with FW (r=0.33); WW best predicts FW (r=0.49)
No sex differences in BW/WW, but males heavier at FW (111.5 vs 106.9 kg; p=0.009)
Higher BW and WW were associated with higher sow parity ($p < 0.001$). Piglets from parity 1 had lower FW ($p < 0.001$)
> % mortality in BW δ 0.9 kg ($p = 0.025$); represent 52.4% of total mortality
Mortality by phase: 18% lactation, 5% nursery, and 9% growing-finishing. Causes of death were 74% crushing, 10% neonatal diarrhea, 12% euthanasia, and 4% other causes
No association between BW and cause of death during lactation. Statistically significant difference by parity, > in parity 1 ($p = 0.046$)

Discussion and Conclusion

Based on data from this study, WW emerges as a stronger predictor of FW than BW. The findings also suggest that individual electronic identification can inform specific adjustments in nutrition, management, and housing; under the conditions evaluated, such adjustments could be associated with improvements in production metrics

MIS-PP-26

A MACHINE-LEARNING APPROACH TO EVALUATE THE EFFECT OF FLOOR POROSITY AND DETERGENT USE ON CLEANING EFFICIENCY IN PIG FARMS

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Background and Objectives

The average ATP (Adenosine Triphosphate) index is higher in fattening units than in farrowing and post-weaning units (Cantaloube, ESPHM2024). This difference may be related to concrete floor characteristics and to the limited use of detergents in fattening buildings. As cleaning is performed on wet floors, the influence of concrete porosity under these conditions remains unclear. The aim of this study was to evaluate the impact of floor porosity and detergent use on cleaning quality in fattening units.

Material and Methods

Concrete porosity is usually assessed using the ASTM International drop test on dry floors. As no method exists to evaluate porosity on wet/soaked floors in farm conditions, we developed a machine-learning–based approach. Floor areas were first classified as “Smooth” or “Porous” using the ASTM test on dry surfaces. Floors were then washed and left in soaked condition representative of post-washing conditions in farms. Thermal images were taken at T0, followed by the addition of 10 drops of boiling water, and additional images were recorded after 15, 30, 45,60 seconds. A database of 250 paired datasets (thermal images and ASTM classifications) was built. The algorithm was trained on 70% of the data and tested on 30%. After washing, thermal images were used to classify floor porosity, and ATP measurements were collected: 73 samples on smooth floors with detergent and 29 without; 230 samples on porous floors with detergent and 55 without.

Results

The most efficient model was a Support Vector Classification model, with 84.2% sensitivity and 89.5% specificity. Without detergent, ATP values were significantly higher on porous floors than on smooth floors (37,967 vs. 19,171 RLU, $p<0.05$). When detergent was applied, no significant difference was observed between porous and smooth floors ($p>0.05$).

Discussion and Conclusion

Concrete porosity remains a critical factor affecting cleaning efficiency under wet conditions. Detergent use mitigates the negative impact of porous floors, highlighting its key role in improving hygiene in fattening units.

MIS-PP-27

CARCASS WEIGHT AND SANITARY IMPROVEMENT THROUGH CHANGES IN MANAGEMENT AND IN MYCOPLASMA HYOPNEUMONIAE, PCV2 AND INFLUENZA PIGLETS' VACCINATION PROTOCOL IN A FRENCH FARROW-TO-FINISH FARM

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Background and Objectives

Mycoplasma hyopneumoniae (M Hyo), PCV2 and swine influenza type A virus (swIAV) are pathogens commonly involved in respiratory disorders on pigs leading to growing and economical losses. Inadequate management can increase pathogens pressure within a herd. This study aimed to monitor the evolution of carcass weight in a single farm following the implementation of different pathogen control strategies.

Material and Methods

This farm is a 1000-sow farm facing respiratory troubles and poor growing performances on reared pigs. Successive changes were implemented. First, HYOGEN and CIRCOVAC (DUO) replaced the previous intradermal M hyo and PCV2 combo vaccine (IDCV) for 4 piglets' batches. Second, improvements in pig management were applied to piglets vaccinated with the initial IDCV, including maintaining batch integrity in the nursery, implementing animal and human sectorisation, and introducing feeding changes on fatteners (protein intake increase). Third, after the detection of H1avN1 swIAV on 5-, 7- and 10-weeks old piglets, one shot of RESPIPORC FLU 3 has been administered at weaning simultaneously to DUO while maintaining good management practices. The carcass weights have been compared between the Initial period (2557 slaughtered pigs) and the First (1185 slaughtered pigs), Second (5448 slaughtered pigs) and Third (1712 slaughtered pigs) periods.

Results

The mean carcass weight increased from 88 kg (Initial) to 89.2kg (First), 91.9 kg (Second) and finally 95.2kg (Third). The proportion of carcasses weighing less than 82 kg decreased from 23.2% (Initial) to 5.3% (Third) The carcass rate with respiratory-related condemnations has dropped from 6.6 carcasses ‰ in Second period to 2.9‰ in Third period. This was in line with the decrease of respiratory clinical signs observed on reared pigs in the farm.

Discussion and Conclusion

This monitoring of slaughter performances illustrated the sanitary and growing inputs of a series of changes: internal biosecurity improvement, protein enrichment of the diet and new vaccinal strategies at weaning.

MIS-PP-28

COLIPROGRESS: A SATISFACTION SURVEY OF EARLY USERS

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Background and Objectives

A digital tool, developed in collaboration with technical experts, provides a comprehensive overview of risk factors impacting piglet intestinal health. The tool aims to standardize and simplify zootechnical data collection in farms, enabling effective monitoring and valuable benchmarking for continuous improvement. The objective of this study was to survey the first users to identify the tool's strengths and areas for improvement.

Material and Methods

An online survey was conducted between June and September 2025 among 30 initial users of ColiPROGRESS. The questionnaire included both multiple-choice and open-ended questions covering general satisfaction, user experience, content relevance, time required, necessary equipment, and the tool's perceived added value. A total of 18 veterinarians and technicians completed the survey.

Results

Overall satisfaction with the application and its content was high, with a mean score of 3.8/5 (72% of users gave a 4/5 rating). Consequently, 94% of respondents would recommend the tool to a colleague. The grid was considered relevant by 83% of users, and it met the daily needs of 89% of respondents (67% well, 22% perfectly). The average time to complete the full diagnosis and report was between 2.5 and 3.5 hours, which was deemed appropriate. 78% of users preferred using the paper booklet, citing biosecurity and connectivity issues, before entering the data into the web application.

Discussion and Conclusion

The digital tool is highly appreciated by its first users for its structured and in-depth approach to diagnosing piglet gut health issues. Key strengths include its comprehensive question set, the objectivity of required on-farm measurements, and the time-saving automated generation of benchmarked reports. Revisions to some question wordings were also suggested. It's recognized as a valuable tool that effectively structures on-farm diagnostics. Future enhancements based on this user feedback will be key to establishing it as a valuable resource for monitoring intestinal health of swine herds.

MIS-PP-29

ANTIPARASITIC DRUG USAGE IN PIG PRODUCTION IN SWITZERLAND

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Background and Objectives

Information on antiparasitic use and management practices in Swiss pig production is limited, while concerns regarding anthelmintic resistance and environmental impacts are rising. This study aims to update national data on antiparasitic treatments and to assess differences in treatment intensity between production systems and farm sizes.

Material and Methods

Records from the Swiss Electronic Treatment Journal (ETJ) for 2024 were analysed, including all farms with ε5 sows or ε200 finisher pigs (89% of Swiss pig farms). Antiparasitic use was quantified using the proportion of animals treated and the Animal Treatment Index (ATI), and analyses were conducted across age categories and active substances. Farm-size comparisons using flubendazole ATI were performed for finisher pigs on finishing farms and for adult pigs on breeding farms, and ATI was also compared between specialised breeding farms and combined breeding-finishing farms.

Results

Treatment intensity varied across age categories: 38.3% of adult pigs, 31.9% of suckling piglets, 1.8% of weaned pigs and 7.2% of finishers were treated. Toltrazuril was used exclusively in suckling piglets, while flubendazole dominated treatments in weaned pigs (87.3%), finishers (90.8%) and adults (>88%). Median ATI values were 0.76 in suckling piglets, 0.28 in weaned pigs, 0.62 in finishers and 1.21 in adults.
Across finishing farms, median ATI values were 0.74 in small, 0.66 in medium and 0.47 in large farms, indicating higher treatment intensity in smaller farms (p=0.0032). Among breeding farms, median ATI increased with farm size, with values of 0.94 in small, 1.19 in medium and 1.28 in large farms (p=0.0067). Median flubendazole ATI in adult pigs was similar between specialised breeding farms (1.21) and combined breeding-finishing farms (1.13) (p=0.49).

Discussion and Conclusion

The findings show marked variation in antiparasitic use across age categories and heterogeneity in ATI across farms, underscoring the need for updated guidelines to support targeted and sustainable parasite control.

MIS-PP-30

UMBILICAL INFECTION IN PIGLETS: PREVALENCE AND CLINICAL SYMPTOMS – A PILOT STUDY

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Background and Objectives

Umbilical infection is considered a predisposing factor for septicaemia and umbilical outpouchings (UO) in pigs. Therefore, most newborn Danish piglets are treated metaphylactically with antibiotics during the first days of life, despite no scientific reports on the prevalence of umbilical infection. Correct identification of infected piglets is important, so antibiotic treatment can be reserved for clinical cases, and the risk of antimicrobial resistance can be reduced. This study estimates the prevalence of clinical signs of umbilical infection in 2 herds.

Material and Methods

Piglets were included from 2 Danish herds and had not been treated with metaphylactic antibiotics. Piglets were examined at approximately 7 and 10 days old in herd A and B, respectively.The recorded clinical signs of umbilical infection were: A hard and swollen umbilicus, redness in the periumbilical tissues or pus from the umbilical tissues.

Results

The prevalence of piglets with a hard and swollen umbilicus was 4.6% (15/325) and 5.5% (33/602) in herd A and B, respectively. In addition, 13.5% (44/325) and 15% (90/602) piglets had records of a swollen but not hard umbilicus.No piglets had pus, localized heat or redness around the umbilicus. Only one pig, with a concurrent joint infection, had fever (rectal temperature = 41°C) All piglets were bright, alert and responsive. All piglets with clinical signs of infection also had a scab of varying size on their umbilicus.

Discussion and Conclusion

Up to 5.5% piglets showed clinical signs of umbilical infection in the second week after birth in two Danish herds, and an additional 15% had signs of inflammation. Since no pigs showed affected general condition, clinical signs of umbilical infection may reflect a localized immune response. The efficacy of antibiotic intervention at this stage in promoting recovery and/or preventing UO development remains to be established.

MIS-PP-31

CAUSES AND CONSEQUENCES OF UNCONTROLLED INGESTION OF UNSUITABLE OBJECTS IN MINIPIGS

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Background and Objectives

While diseases caused by ingesting foreign materials are of minor importance in conventionally housed pigs, minipigs kept in home and garden environments face a risk of consuming unsuitable objects and substances. The two cases presented here illustrate how minipig owners can misjudge the digestibility of these items. As a result, incomplete or inaccurate medical histories and the presence of non-specific clinical signs complicated the diagnostic process and contribute to delayed intervention.

Material and Methods

Two minipigs were presented in the clinics due to refusal to eat. In the first case, the owners suspected the intake of corncobs two days earlier as the cause of the loss of appetite. The owners of the second minipig believed that it had eaten chicken bones from the compost in the garden.

Results

Loss of appetite and reduced faecal excretion suggested the presence of an intestinal obstruction. A heavily filled stomach and slowed intestinal motility were detected by X-ray and ultrasound, respectively. The causes expected on the basis of the preliminary report could not be demonstrated. In the first pig, it was only after vomiting a peach pit that the real cause of the gastrointestinal disorder became apparent. At this point the owners confirmed that the pig had unrestricted access to fallen peaches from their own tree. In the second case, gastrostomy revealed that the animal had ingested large quantities of clumping litter from a cat litter box. The owners admitted that their pet likes to root in the litter box and also eats the content. Both pigs were saved by gastrotomy and enterotomy.

Discussion and Conclusion

Some minipig owners lack knowledge about the specifics of the animals they keep, their behaviour and their physiological needs. Misinterpretation of the term omnivore can therefore lead to life-threatening consequences for their pets.

MIS-PP-32

REDUCTION OF OOCYST EXCRETION IN LITTERS THROUGH EARLY ADMINISTRATION OF THE COMBINATION OF TOLTRAZURIL AND INJECTABLE GLEPTOFERRON

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Background and Objectives

Coccidiosis in piglets is caused by the protozoan Cystoisospora suis, which is one of the most prevalent enteric parasites found on pig farms. The practice on pig farms is to administer one shot of Gleptoferron and Toltrazuril between 24 and 96 hours of the piglet's life. The objective of this study was to compare two protocols with different application times, through oocyst counting.

Material and Methods

The study was conducted on a Brazilian farm housing 7,500 breeding sows. 36 sows were selected based on parity and body condition score and divided into two groups of 18 each. Each litter was identified using numbered ear tags. Feces were collected twice on when the piglets were 10 and 18 days of age (DOA). Feces samples (minimum 5 piglets per litter) were pooled and examined by flotation. Group 1 received treatment between 48–72 hours (N=90), and Group 2 was treated with an average of 27 hours (N=90). The average oocyst count (OPG) was determined using a t-test.

Results

Group G1 showed a prevalence of 66%, with an average oocyst count of 16,347, and Group G2 showed a prevalence of 6%, with only 1 positive litter, with an oocyst count of 6,000, $p<0.05$.

Discussion and Conclusion

We understand that early administration of the product brings benefits, in this case a significant reduction in oocyst count when the molecule is applied earlier. In addition to the reduction in oocysts.

MIS-PP-33

EFFECT OF DIETARY SUPPLEMENTATION WITH FUNCTIONAL AROMAS AND PLANT EXTRACTS IN LACTATING SOWS ON PIGLETS' GROWTH PERFORMANCE AND DIGESTIVE HEALTH.

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Background and Objectives

At farrowing, sows experience pain and stress leading to a drop in feed intake after parturition which can affect piglets' growth, diarrhea and mortality. The aim of this trial was to investigate the effects of dietary supplementation with a combination of functional aromas and plant extracts in lactating sows on piglets' growth, diarrhea and survival.

Material and Methods

The trial was conducted in a French commercial farm. A total of 24 sows from 2 batches were divided into 2 experimental treatments: 1) Control, standard lactation feed, 2) Control feed + a blend of functional aromas and plant extracts included at 350 g/tonne of feed from farrowing (d.0) to weaning (d.21 post-farrowing). Sows were blocked by parity and were monitored according to the farmer's practices. The number of piglets total born, born alive as well as the total number of piglets weaned were recorded for each sow. Litter weight was recorded at birth and at d.21 post-farrowing. Piglets' diarrhea was scored on a four-points scale (0 = normal feces, 1 = soft feces, 2 = mild diarrhea, and 3 = severe watery diarrhea). Data was analyzed using ANOVA on SAS software.

Results

There was no effect of the batch on any parameter of interest. Piglets raised under sows which received the supplement had a higher average daily gain than control piglets (312 vs 274 g/day; $p<0.05$). There was no difference in diarrhea scores between piglets raised under sows which received the supplement and the control group ($p>0.05$). Pre-weaning mortality was 8.8% for the control group and 5.4% for the supplemented group ($p>0.05$).

Discussion and Conclusion

In conclusion, supplementing lactating sows with a combination of functional aromas and plant extracts can increase litter weight at weaning. However, it did not influence piglets' survival and post-weaning diarrhea.

MIS-PP-34

EFFECT OF NANO-ENCAPSULATED PHYTOGENICS ON INTESTINAL IMMUNITY AND SERUM HAPTOGLOBIN.

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Background and Objectives

Weaning is a critical moment for piglets, which face numerous stressful changes that can lead to a transient but long lasting immune stimulation[1], resulting in a loss of intestinal integrity. The objective of this study was to evaluate the changes in calprotectin (CALP; marker of intestinal inflammation), Occludin (OCDL; indicator of intestinal epithelial integrity) and IFN-© (proinflammatory cytokine) in intestina and seric haptoglobin related to the use of different concentrations of nano-encapsulated phytogenics in feed.

Material and Methods

A total of 702 healthy weaned piglets (average weight: 5.50 kg) were individually weighed and randomly assigned to three dietary treatments: a control group (CON) fed a basal diet; a low-dose group (DI-L) receiving the basal diet supplemented with 1.25 kg/ton of the additive; and a high-dose group (DI-H) receiving the basal diet plus 2.50 kg/ton of the additive. From each pen, one representative piglet was selected for fecal sampling on days 4, 17, and 40 postweaning (dpw). Gene expression analysis was performed on these fecal samples following previously established protocols.

Results

Differences were found for CALP (40dpw CON vs DI-L) and OCLD (21dpw, CON vs DI-L). Analyzing the evolution over time, a significant decrease in CALP, an increase in ZON, and a biphasic response in OCLD, IFNg, and TGFb were observed in all groups. But, interestingly, Haptoglobin showed a significant increase over time with differences between 0 and 14 days with 40 dpw in all groups and difference between CON and treated groups at 40 dpw, but HAP levels never exceeded the threshold for pathological values.

Discussion and Conclusion

The results indicate that the treated groups have an increase in zonulin and haptoglobin over time and an increase compared to CON, which indicate better maintenance of homeostasis, the main function of acute phase proteins.

MIS-PP-35

ANALYSIS OF LEAN MEAT PERCENTAGE AND CARCASS PAYMENT IN 3 DANISH COMMERCIAL SWINE FARMS REPLACING MALE PHYSICAL CASTRATION WITH IMMUNOLOGICAL CASTRATION

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Background and Objectives

Immunological castration is an alternative to physical castration of male pigs, improving carcass composition, grading, and pricing. This study quantified differences in lean meat percentage between immunocastrated and physically castrated males, assessing contributions to indexed settlement price per kg.

Material and Methods

This study analyzed slaughter records from 4456 immunocastrates and 7468 physically castrates across 3 Danish swine farms transitioning to immunological castration. Vaccination with Improvac® (Zoetis) was implemented in autumn 2024. Group differences were tested using Welch's t-test (alpha=0.05), and indexed price was calculated based on weight and lean percentage surcharges/deductions.

Results

The study revealed significant differences in lean meat percentage and indexed settlement prices between immunocastrates and physically castrated males across all herds. Lean meat percentage increases; Herd 1: 2.22% (95% CI: 2.10–2.33; p<0.001), Herd 2: 1.49% (95% CI: 1.36–1.62; p<0.001), and Herd 3: 2.32% (95% CI: 2.18–2.47; p<0.001). Indexed settlement price increases (€ per kg); Herd 1: €0.027/kg (95% CI: 0.171–0.225; p<0.001), Herd 2: €0.020/kg (95% CI: 0.128–0.176; p<0.001), and Herd 3: 0.038/kg (95% CI: 0.256–0.305; p<0.001). The slaughter weight depended on slaughterhouse demand and was non-standardized. Differences in slaughter weights were significant only for herds 1 and 3; Herd 1: -4.38 kg (95% CI: −4.84 to −3.93; p<0.001), Herd 2: 0.11 kg (95% CI: −0.31 to 0.52; p=0.616), and Herd 3 2.8 kg (95% CI: 2.32–3.24; p<0.001). The distribution across deduction classes shifted towards favorable grading for immunocastrates.

Discussion and Conclusion

These results demonstrate that the use of immunological castration significantly increases the lean meat percentage and indexed settlement prices under commercial conditions, highlighting its potential economic benefits and impact on carcass composition in swine production systems.

MIS-PP-36

RETROSPECTIVE REVIEW OF TRACHEITIS CASES IN PIGS SUBMITTED TO THE SCANNING SURVEILLANCE NETWORK IN ENGLAND 2011-2025

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Background and Objectives

Tracheitis is a relatively uncommon pathological finding in pigs in England. Here, we detail the clinical presentation, pathology, and diagnoses made in tracheitis cases submitted from 2011-2025 for government-subsidised diagnostic testing.

Material and Methods

Thirteen past cases of tracheitis were reviewed. Clinical signs; postmortem findings; and laboratory results including histopathology, bacteriology and PCR testing for swine influenza A (SwIAV) and PRRSV were analysed.

Results

Cases affected finisher pigs (8), replacement gilts (2), growers (2) and one weaner. All presented with respiratory signs, including coughing (7), dyspnoea (2) and sneezing (1). Additional signs included mortality (6), lethargy (1) and wasting (1). Postmortem examination revealed tracheal inflammation with froth or catarrhal exudate (5) and peeling fibrino-necrotic membranes (7). All cases had pneumonia, characterised by cranio-ventral (8) or caudo-ventral (3) consolidation, diffuse pleuropneumonia (1) or mild patchy reddening (1). Histologically, tracheas in all cases displayed mucosal oedema, haemorrhage and necrosis, with fibrinosuppurative exudate. One case had pandemic H1N109 SwIAV, supported by immunohistochemistry in tracheal sections. Bacteria identified in ten of eleven pneumonic cases included Pasteurella multocida (2), Streptococcus dysgalactiae equisimilis (2), Mycoplasma spp. (3), Truperella pyogenes (1), Glaesserella parasuis (1), Streptococcus suis (1) and Streptococcus porcinus (1), and histopathology confirmed fungal disease in one. PRRSV was detected in two cases; porcine cytomegalovirus in one case. No agents were identified in three cases.

Discussion and Conclusion

These tracheitis cases typically occurred sporadically in individual pigs, most commonly finishers. Only one outbreak was identified resembling the haemorrhagic tracheitis syndrome described in North America. A range of bacterial and viral causes were identified, with none predominating. The bacterial pathogens likely represented secondary opportunistic infections. Viruses detected had uncertain association with the tracheal pathology apart from one case in which multiple pigs were affected where SwIAV involvement in the tracheitis was confirmed.

MIS-PP-37

INFLUENCE OF QUORUM SENSING INHIBITION (QSI) AS A MEANS OF CONTROLLING BACTERIAL DIARRHOEA IN NEONATAL PIGLETS – A CASE REPORT

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Background and Objectives

Neonatal diarrhoea is a major economic disease in pigs, causing substantial production losses and prompting antimicrobial use. A 650-sow German nucleus herd with Danish genetics, managed in a one-week batch system, experienced neonatal diarrhoea in over 60% of litters and pre-weaning mortality exceeding 20%. This case report evaluated whether a Quorum-Sensing-Inhibiting (QSI) approach could reduce neonatal diarrhoea and mortality. QSI is a technology to reduce bacterial virulence and biofilm formation.

Material and Methods

Three consecutive groups were compared: Control (C; 23 litters), treatment 1 (T1; 27 litters) and treatment 2 (T2; 131 litters). Piglets in T1 and T2 received an intramuscular cephalosporin on day one. In addition, T2 piglets received two ml of a QSI-based oral product (Piglet Control™) at birth and on day two via a pig-pump. Good veterinary practice and farm management adjustments were implemented equally across groups. Diarrhoea incidence and mortality were recorded for each litter on days one to three after birth.

Results

Compared with C, T1 showed no significant difference in litters affected by neonatal diarrhoea ($p = 0.31$). T2 demonstrated a highly significant reduction ($p < 0.001$): only 8% of litters in T2 were affected on days one to three versus 55% in T1 and 70% in C. Mortality on day three was significantly reduced in T2 compared with both T1 and C ($p < 0.001$); no significant difference was observed between C and T1 ($p = 0.86$). Mortality rates were 6.5% in C, 6.7% in T1 and 3.3% in T2.

Discussion and Conclusion

Non-antibiotic strategies are becoming essential. Modulating quorum-sensing systems - key regulators of virulence, toxin production and biofilms- offers a promising option. A holistic, interdisciplinary concept addressing management and infectious factors - supported by QSI - achieved sustainable stabilisation. QSI is an effective complementary tool to disrupt bacterial communications, enabling management interventions to regain control.

MIS-PP-38

EFFECT OF DIFFERENT INCLUSION LEVELS OF A NANO_ENCAPSULATED PHYTOGENIC BLEND IN POST-WEANING DIETS ON THE PRODUCTIVE PERFORMANCE AND THE INFLAMMATORY AND OXIDATIVE STATUS OF NURSERY PIGLETS.

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Background and Objectives

Weaning is a critical moment for piglets, which face numerous stressful changes that can lead to a transient but long lasting immune stimulation, resulting in a loss of intestinal integrity[2]. The objective of this study was to evaluate the changes in calprotectin (CALP), Occludin (OCDL) and IFN-© related to the use of different concentrations of a nano-encapsulated phytogenic blend in feed.

Material and Methods

702 healthy weaned piglets, were individually weighed and allocated to three experimental treatments: control group (CON) receiving a basal diet and basal diet, Group lower dose (DI-L) receiving basal+1.25 kg/tonne of the additive and Group Higher dose (DI-H) receiving basal diet+ 2.50 kg /tonne of the additive. From each pen, one average piglet was selected for faecal sampling on days 4th,17th and 40th. The gene expression was performed on fecal samples as previously described.

Results

At 40 days after weaning, significant differences in CALP were observed between CON and the DI-L experimental group (p=0.025), this group showed a significant reduction in CALP compared to the control group.In terms of OCDL, 21 days post-weaning, significant differences were observed between the CON and DI-L (p=0.012), with the DI-L experimental group obtaining better result in terms of OCDL quantity. Likewise, it was demonstrated that there are no significant differences but a trend to significance (p=0.067) between DI-H and DI-L indicating that at a higher concentration of product, piglets will show a greater amount of OCDL.However, although numerically higher levels of IFN© were obtained in the experimental group, no significant differences were found between CON and DI-L (p=0.101).

Discussion and Conclusion

The results showed suggest that a low concentration of nano-emulsified phytogenic blend in feed has favoured a reduction in CALP, an increase in gene expression for OCDL for DI-L and a non-significant increase of ARNm for IFN©. All together suggests a lower inflammation of intestine after weaning.

MIS-PP-39

FALSE POSITIVE RATES IN COMMERCIAL ELISA TESTS FOR PRRSV AND MYCOPLASMA HYOPNEUMONIAE IN EUROPEAN PIG BREEDING FARMS

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Background and Objectives

In European pig breeding programs, serological surveillance is routinely performed using Enzyme-Linked Immunosorbent Assay (ELISA) diagnostic assays. The aim of this retrospective study was to compare the false positive rates (FPR) of commercial ELISA kits for Porcine Reproductive and Respiratory Syndrome virus (PRRSv) and Mycoplasma hyopneumoniae (Mhyo) based on gender, laboratory, and time.For this analysis, the FPR was defined as the proportion of ELISA-positive samples (S/P ε0.40) which tested negative in a secondary test, originating from herds historically classified as negative and maintaining a negative status in subsequent surveillance.

Material and Methods

Over a two-year period, there were a total of 56,226 PRRSv and 20,547 Mhyo ELISA results. All tests were performed using the same commercial ELISA kits across twelve European laboratories (applying >=0.40 S/P for PRRSv and >0.40 S/P for Mhyo as the positive cutoff). FPR comparisons were performed using Rstudio (v2024.12.1) by gender category (Adult Males (AM), Young Males (YM), and Miscellaneous (MIS)), laboratory (1-12), and time (FY24 vs FY25).

Results

Gender analysis revealed that the Mhyo FPR was significantly higher in the AM group than in YM and MIS ($p<0.05$). PRRSv FPR showed no significant gender effect.Regarding the 12 laboratories used across Europe, significant differences in the Mhyo FPR were found for laboratory 3 and laboratory 5 relative to laboratory 6. No significant differences were found in PRRSv FPR between laboratories.Mhyo FPR decreased significantly from FY24 to FY25 ($p<0.05$) while PRRSV FPR increased over the same period ($p<0.05$).When analyzing gender FPR across time periods, it was confirmed that the Mhyo FPR in the AM group was consistently higher than that of the MIS group in both FY24 and FY25.

Discussion and Conclusion

These findings suggest that factors such as adult male (AM) physiology and management conditions may contribute to increased FPR in specific Mhyo ELISA tests.

MIS-PP-40

INTRAMUSCULAR FAT DEPOSITION: A COMPARISON AMONG THREE MINORITARY INDIGENOUS SPANISH BREEDS

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Background and Objectives

There are six minority native breeds in Spain: three from the Celtic lineage (Porco Celta, Gochu Astur-Celta, and Euskal Txerri) and three from the Iberian lineage (Chato Murciano, Negre mallorquí, and Negro canario). All of them are in danger of extinction. This abstract presents research on intramuscular fat (IMF) in these breeds.

Material and Methods

Dorsal ultrasounds were performed on 130, 122, and 131 Porcos Celta (PC), Chatos Murcianos (CM), and Negros Canarios (NC) pigs, respectively. Four ultrasounds were briefly performed at point P2 and on the 10th rib, approximately 6 cm from the dorsal line, to estimate the IMF, loin depth (LD), estimated lean meat, and backfat thickness (BFT). The weight and age of the animal were recorded.

Results

An average of 2.9% was found for PC, 3.9% for CM, and 3.6% for NC, with significant differences between all of them ($p<0.001$). For BFT, a difference was observed between PC and NC with MC, with 23.0 PC, 25.0 NC, and 28.12 CM, demonstrating that all of them are adipogenic breeds. Both LD and BFT were influenced by the age and weight of the animals. When correlations were made, significant correlations were found between IMF and BFT in CM ($r=0.222$, $p<0.001$) and NC ($r=0.160$, $p=0.068$), but not in PC.

Discussion and Conclusion

The results show a high IMF deposition capacity in the loin in all three breeds, higher than that of early maturing white breeds. The dispersion of the data provides an opportunity for selection based on this trait. Breeds derived from the Iberian lineage show a correlation between BFT and IMF, but not those from the Celtic lineage.

MIS-PP-41

BEYOND ANEMIA: A CROSS-SECTIONAL STUDY ON MYCOPLASMA SUIS, FRUCTOSAMINE, AND VERTICAL TRANSMISSION

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Background and Objectives

A sow farm in northern Italy recurrently experienced pale mucous membranes, lethargy, and vulvar and mammary edema in sows. Hypogalactia was suspected due to the repeated premature transfer of undernourished piglets (1.94±0.92 per litter) to nurseries during mid-lactation, in the absence of other clinical signs in piglets. A pre-weaning mortality rate of 26.84±4.21% was also observed. Previous diagnostic investigations for PRRSV and Leptospira spp. were negative. A cross-sectional study was therefore conducted to detect Mycoplasma suis and assess its association with sow hematological status, focusing on fructosamine as a marker of infection-related hypoglycemia.

Material and Methods

The study involved 65 sows (parity 1–8) and 75 of their piglets. Blood samples were collected from all sows at 110 days of gestation. Piglets were sampled at three time points: before colostrum intake (n=14), at 3- days of age (n=50), and at 2.5-months of age (n=25; weaning site). Detection of M. suis was performed using a SYBR-Green rt-PCR. In sows, a complete blood count and serum fructosamine determination were performed.

Results

M. suis was detected in 100% of the sows, while no pre-weaning piglets tested positive. The mean hemoglobin concentration in sows was 11.48±1.04 g/dL (min-max: 7.80–14.10 g/dL), whereas the fructosamine level was 282.4±19.4 ⌈mol/L (min-max: 233–392 ⌈mol/L). M. suis was detected in 33% of the piglets sampled after weaning.

Discussion and Conclusion

The 100% sow prevalence, together with the absence of infected pre-weaning piglets, deviated from literature reports. Detection of M. suis in 33% of post-weaning piglets revealed a discrepancy between pre- and post-weaning infection status, with transmission dynamics remaining speculative (post-weaning exposure, genotype-dependent vertical transmission, transient maternal antibody protection, or low bacterial loads). Mean hemoglobin concentrations were below literature references (11.6-12.6 g/dL), suggesting anemia, whereas fructosamine levels were not significantly altered. Overall, these findings suggest complex transmission dynamics and do not support prepartum hypoglycemia in M. suis–positive sows.

MIS-PP-42

BODY COMPOSITION RESPONSES TO DIFFERENT FEED CURVE STRATEGIES IN GESTATING SOWS

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Background and Objectives

Nutritional management to maintain ideal body condition in sows is essential for efficient swine production. Sows deviating from an adequate body condition may impaired reproductive performance, and have poorer longevity. Farmers adopt various strategies, such as adjusting feed amounts at specific gestation stages or using different feeding curves to keep sows in an ideal body condition. This study aimed to determine how distributing the same total feed allowance differently across gestation affects sow body composition, assessed through loin depth and backfat.

Material and Methods

A total of 113 sows from seven batches (parity 1–8) were included. During early gestation (days 0–34), all sows received 25% above their calculated metabolically based requirements (Dourmad et al., 2017) to compensate for lactation losses. From mid to late gestation, feeding varied by experimental group: Group A (n=38) sows were fed 25% above requirements from days 35–70 and at requirement from days 70–105; Group B (n=39) sows fed at requirement from days 35–70 and 25% above requirement from days 70–105; and Group C (n=36) sows were fed at requirement from days 35–85 and 50% above requirement from days 85–105. Backfat and loin depth at the P2 point were measured by B-mode ultrasound on days 0, 35, 70, 85, and 105. Data were analyzed with mixed linear models including parity and batch as random effects (lmer, R).

Results

All experimental groups were fed similar ($p>0.05$) amounts of feed during the total gestational period. No differences were observed ($p>0.05$) in backfat or loin depth at any of the measured points.

Discussion and Conclusion

The timing of feed allocation during gestation did not influence sow body condition when total feed allowance was kept constant. These findings suggest that, within the tested ranges, the distribution pattern of gestational feed does not significantly affect body composition dynamics, although the effect on reproduction parameters still needs to be analyzed.

MIS-PP-43

EFFECT OF INJECTABLE TOLTRAZURIL AND GLEPTOFERRON ADMINISTRATION ON WEANING WEIGHT OF PIGLETS COMPARED TO IRON DEXTRAN AND ORAL TOLTRAZURIL

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Background and Objectives

Iron deficiency anemia and neonatal coccidiosis are two of the most frequent and economically relevant diseases of piglets in intensive pig production. The objective of this study was to compare the effect of treatment with a combination of injectable toltrazuril and gleptoferron (T1) and oral toltrazuril and iron dextran injectable (T2) on the pre-weaning weight gain of piglets under commercial conditions.

Material and Methods

The study was conducted on a 1,000-sow commercial farm in Cutral Co, Neuquén Province, Argentina, between July and September 2025. The trial was carried out in seven consecutive farrowing pens, with 3,368 piglets from 264 litters included. In each pen, half of the litters received T1 (45 mg of toltrazuril and 200 mg of iron as gleptoferron– Forceris – Ceva Animal Health) on day three of age, and the rest of the piglets (T2) received standard treatment applied on the farm (200 mg of iron dextran injectable and 5% oral toltrazuril (20 mg/kg) on day three of age, allowing separation of the effects of the different treatments applied. The piglets were weighed at birth and at weaning (21 DOA), and the average weight per litter was recorded. The data were analyzed using ANOVA.

Results

The average birth weight did not show significant differences between treatments ($p = 0.7733$), with a mean value of 1.35 ± 0.02 kg for both T1 and T2 groups respectively. The final weaning weight showed a significant difference between two treatments: T1 = 7.09 ± 0.97 kg and T2 = 6.68 ± 1.10 kg. $P< 0.05$.

Discussion and Conclusion

The results of the study demonstrated that injectable administration of toltrazuril combined with gleptoferron resulted in better weight gain at weaning compared to conventional treatment with 5% oral toltrazuril and injectable iron dextran. This is the first study conducted in Argentina using an injectable combination of toltrazuril and gleptoferron recently registered in the country.

MIS-PP-44

COMPARISON OF INJECTABLE TOLTRAZURIL-GLEPTOFERRON AND ORAL TOLTRAZURIL+ IRON DEXTRAN FOR THE PREVENTION OF ANAEMIA AND COCCIDIOSIS UNDER THE FIELD CONDITIONS ON LARGE SCALE FARM IN VIETNAM

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Background and Objectives

Coccidiosis is a widespread protozoal disease of piglets which is characterized by watery or creamy diarrhoea, and causing negative impact on zootechnical performance. Iron deficiency anemia (IDA) is frequent problem occurred on farms which negatively impacts body condition, immune response, and animal welfare of affected piglets. The objective of presented study was evaluate effect of injectable toltrazuril/gleptoferron based product on performance and hematinic status of piglets at weaning.

Material and Methods

Comparative randomized study was performed on large scale farm (13500 sows inventory) located in Vietnam. Two groups according to the treatment were compared in parallel design, group A (fixed injection 45mg toltrazuril+ 200 iron gleptoferron, Forceris, Ceva Sante Animale) injected 2nd day of life vs. group B (oral toltrazuril + iron dextran) applied according to farm practice. In total 241 piglets were randomly selected and included. Bodyweight gain was analyzed using a linear model with the daily bodyweight gain as response variable, the group and the bodyweight at D0 as fixed effects. Hemoglobin change from D0 was analyzed using a linear model with the hemoglobin change as response variable, the group and the hemoglobin at D0 as fixed effects.

Results

The average daily weight gain was significantly better in the group A: 260 g; 170, 360 vs. group B: 250 g; 150, 380 g (expressed as mean and min/ max) (P= 0.047). Despite the difference in Hb status on the beginning of the study in favor for group B, the average value of Hb was higher in group A (111.85 vs. 77.39 g/l), with significant difference in distribution of Hb change from D0 (g/l) in favor the group A (P= <0.001).

Discussion and Conclusion

Injectable combo product, which was recently introduce on Vietnam improved the zootechnical performance as well hematinic status of piglets at weaning, under the conditions of large commercial farm.

REP-PP-02

INFLUENCE OF DAM PARITY ON THE PROLIFICACY OF HER OFFSPRING

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Background and Objectives

Gilts are widely used in breeding farms to produce their own replacement, maximizing genetic progress by reducing generation interval and taking advantage of animals with superior genetic merit. However, offspring from first-parity sows may have lower birth weights and be more vulnerable to diseases. The objective of this study was to compare litter size (total born piglets; TB) of gilts originating from first-parity sows with that of gilts from multiparous sows when both groups were used as great-grandmothers (GGPs) in a commercial breeding farm.

Material and Methods

The prolificacy of 1788 primiparous Large-White sows born in a commercial breeding farm between 2019-2023, was analyzed. These primiparous sows were divided into two groups based on whether they were offspring of a first-parity (n = 787) or multiparous sow (n = 1001). All the gilts included in this study were inseminated within the pure breed, at a similar age, and under comparable management conditions. An analysis of variance was done for TB including as fixed effects the dam parity (primiparous vs. multiparous), year and their interaction. The TB of the litter of origin was included as a covariate.

Results

Regarding the prolificacy at the first cycle, gilts originating from primiparous dams showed higher TB values than those from multiparous dams (13.1 vs. 12.8; SEM = 0.13; P = 0.029). Overall, year also had a significant effect (P = 0.018) indicating a positive trend in TB overtime. However, the interaction between dam parity and year was not significant (P = 0.436), as well as the covariate (P = 0.384).

Discussion and Conclusion

The results of this study support that using gilts from first-parity sows as GGPs in breeding farms with good management practices and health status, is recommended, not only to reduce the generation interval and maximize genetic progress, but also because of good reproductive results in their progeny.

REP-PP-03

HEMOGLOBIN STATUS IN SOWS: ASSOCIATION WITH PARITY, LITTER OUTCOME AND PIGLET SURVIVAL

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Background and Objectives

The objective of this study was to investigate the hemoglobin levels in sows before parturition and examine possible links between anemia, parity, and productivity. Previous studies has demonstrated a high prevalence of anemia in sows during late gestation. Evidence also suggests that anemia in sows at parturition could be linked to a lower reproductive performance such as higher percentage of stillbirths.

Material and Methods

Five farms located in Sweden were enrolled in the study. In total 449 sows were tested for anemia using the Hemocue 801 box-side hemoglobin analyser. The number of piglets born alive or dead and the mortality during the first three days of life was recorded. At time of weaning the number of weaned piglets and an overall score for that litter was recorded.

Results

In total 41% (n= 184) of the sows were considered anemic (hemoglobinconcentration <103 g/L). The hemoglobinconcentration varied with parity and a negative linear correlation was observed (-1.9 with covariance of -8.1 p<0.001). Sows with anemia produced more live born piglets (hb <103 17.2 ±3.2 vs. hb ε103 15.8 ±4, p <0.01) while no difference in percentage of stillbirths (hb <103 6.7% vs. hb ε103 6.6%, p= 0.936) was noted. Sows with anemia showed a lower piglet survival rate during the first 3 days however no differences in the number of weaned piglets was observed (hb <103 13.3 ±1.90 vs. hbε103 13.1 ±1.94, p= 0.388).

Discussion and Conclusion

Anemia affected 41% of sows in this study and the hemoglobinconcentration of the sows followed with parity as has been demonstrated previously. There was a difference in total number of born piglets between the anemic and non anemic sows, however there was no significant difference in number of still born piglets or the overall productivity.

REP-PP-04

REPRODUCTIVE CAPACITY OF HIGH-PERFORMANCE CONTEMPORARY GILTS OF DIFFERENT AGES

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Background and Objectives

The current recommendations for the first breeding of high-performance gilts suggest that it should occur at the second or third estrus, depending on genotype, age, body weight and growth rate. Knowing that gilts' reproductive performance has been positively associated to sow longevity, it is crucial to improve reproductive efficiency in these females. This study aimed to evaluate reproductive tract morphological parameters in high-performance gilts at different ages.

Material and Methods

Twenty gilts (Camborough®, Agroceres PIC, Brazil) were weighed individually at selection (150 days (d) of age). Based on the average daily weight gain (ADG) at selection, females with ADG greater than 600g were divided into four groups, according to the predicted age at first insemination: G1(195-200d), G2(200-210d), G3(210-220 and G4(>220d). Females were euthanized approximately 4d after estrus, the reproductive tracts were collected for biometrical and histomorphometrical evaluation. Statistical analysis was performed by ANOVA and comparison of means by Tukey Kramer's test (SAS®).

Results

Biometrical (ovarian weight, uterine length) and histomorphometrical parameters, including uterine tubes mucosa and volumetric proportion of uterine structural components were not affected by age($P>0.05$). Follicular population, atresia rates, and corpora lutea numbers were also equivalent among experimental groups.

Discussion and Conclusion

The results demonstrated that reproductive tract morphological parameters in high-performance gilts are comparable regardless of age. This suggests that contemporary gilts at an early age present reproductive tract development compatible with older gilts, providing opportunities for further studies on breeding management strategies.

REP-PP-05

ADENOSINE AS A POTENTIAL FERTILITY BIOMARKER IN BOARS WITH HIGH-QUALITY SEMEN

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Background and Objectives

Seminal plasma (SP) plays a key role in supporting sperm viability, capacitation, and fertilizing ability, and its metabolite profile has been used to predict fertility in several mammalian species. This study aimed to characterize the SP metabolome of boars with similarly high semen quality but different conception outcomes and to identify metabolites associated with fertility potential.

Material and Methods

A total of 31 ejaculates from 19 Duroc boars (12-38 months) were divided into three aliquots. The first aliquot was evaluated immediately after collection, and only ejaculates with ε75% sperm motility and ε75% normal morphology were used for artificial insemination. The second aliquot was extended to prepare semen doses for inseminating 106 Landrace × Yorkshire crossbred multiparous sows. Each sow received two intrauterine inseminations from the same boar: one dose used immediately and the second stored at 17°C until the following insemination. The third aliquot was used for ^{1}H-NMR metabolomic analysis. Conception was confirmed at 35±2 days using real-time B-mode ultrasonography. Based on conception rate, ejaculates were retrospectively classified into HIGH (ε85% conception rate; n=17) and LOW (<85%; n=14) groups. A general linear model was used to analyze differences in SP metabolite composition between the HIGH and LOW conception groups.

Results

Conception rates were 98.6±1.0% vs. 60.3±3.2% in the HIGH and LOW groups, respectively ($P<0.001$). Among the 56 metabolites identified in SP, adenosine was significantly higher in the HIGH group than the LOW group (6.9±0.1 vs. 6.6±0.1, $P=0.022$), whereas most other metabolites did not differ ($P>0.05$).

Discussion and Conclusion

As a product of ATP hydrolysis, adenosine regulates key biological processes essential for sperm function and fertilizing ability. Its association with membrane permeability further supports its role in sustaining energy balance and reproductive performance. In conclusion, despite similar semen quality, differences in SP metabolites were linked to conception outcomes, with adenosine emerging as a promising fertility biomarker.

REP-PP-06

ASSESSMENT OF COLOSTRUM INTAKE BY NEONATAL PIGLETS BY COMPARING ANTIBODY CONCENTRATIONS IN SOWS AND PIGLETS

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Background and Objectives

Colostrum intake in piglets is of vital importance when considering survival, growth and disease resistance. The present study investigated colostrum intake in 10 pig farms.

Material and Methods

Ten Flemish pig farms that agreed to participate, were selected. For each farm, blood was collected on two different occasions, each time from 5 sows and 6 piglets of these sows (<7 days). An ELISA-test was performed on the serum to test for antibodies against Porcine Circovirus type 2 (PCV-2) or swine erysipelas (Erysipelothrix rhusiopathiae). The cut-off values in the tests for PCV-2 and Erysipelothrix rhusiopathiae were 1070 (NEG δ 1070 δ POS) and 40 (S/P % NEG δ 40 δ POS), respectively. Colostrum intake was deemed sufficient when the serum antibody ratio of piglets to sows was ε100%.
In between the two sampling points, potential risk factors for low colostrum intake were collected using a questionnaire. Together with the herd veterinarian, farmers tried to optimise colostrum management based on the results of this questionnaire.

Results

The colostrum intake was sufficient on 4 of the 10 pig farms, and colostrum intake did not improve at the second sampling point. Four other farms managed to increase the colostrum intake based on the questionnaire results and the herd veterinarian's recommendations. Two of these farms even managed to achieve adequate colostrum intake. Colostrum intake was inadequate in two farms at both sampling points, despite implementing corrective measures.

Discussion and Conclusion

The present study showed that colostrum intake is different among pig farms. Colostrum intake can be improved by identifying risk factors and proper guiding of pig farmers, though success is not guaranteed.

REP-PP-07

PARITY-DEPENDENT EFFECTS OF ALTRENOGEST DURING LATE LACTATION ON POST-WEANING FOLLICULAR DEVELOPMENT IN SOWS

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Background and Objectives

During lactation, sows experience physiological anoestrus due to suckling-mediated suppression of the hypothalamic–pituitary axis. After weaning, gonadotrophic activity resumes, triggering follicular growth and ovulation. However, genetic selection for high-performing sows may increase the risk of ovulating suboptimal follicles recruited during late lactation under metabolic stress. Therefore, this study evaluated the effect of altrenogest administration during late lactation on subsequent post-weaning follicular growth in sows.

Material and Methods

Eighty sows (parity 1–6; five-week lactation; 12–14 piglets) were randomly assigned to Control or Treatment (5mL Virbagest®, Virbac, orally for 6-days from −7 to −2 relative to weaning). Follicular diameter was measured by transabdominal ultrasound (17-cm linear probe, 3.5 MHz), reported as the mean of the greatest three on Day0 (weaning) and Day2. Data were analyzed by ANCOVA with parity class (1,2,ε3). Ultrasound-measured sow backfat and muscle thickness at weaning in P2, and number of weaned piglets, were also compared.

Results

Follicular diameter increased from Day0 to Day2 (+0.98 ± 1.17 mm; $p<0.001$). In parity ε3 sows (n=29), treated animals showed greater follicular growth than controls (1.54± 1.09 vs 0.58±1.25 mm; $p=0.021$). No treatment effect was observed in parity 1 (n=34; 0.92±1.37 versus 1.11±1.04) or parity 2 sows (n=16; 0.82±0.88 versus 0.67±1.15).

Discussion and Conclusion

The increased post-weaning follicular growth observed in parity ε3 sows treated with altrenogest suggests a parity-dependent effect. Although the mechanisms were not investigated, it may be hypothesized that in multiparous sows early follicular activation during lactation leads to premature recruitment and reduced oocyte competence, which altrenogest may help prevent. In primiparous sows, a stronger negative energy balance and physiological follicular suppression likely limit any additional inhibitory effect. Overall, under the conditions of this study, altrenogest administration during late lactation appears to support follicular synchronization in older sows, with potential benefits for reproductive efficiency at farm level.

REP-PP-08

COMPARISON OF FARROWING PROCESS AND PIGLET VITALITY IN GERMAN LANDRACE AND GERMAN SADDLEBACK PIGS IN DIFFERENT HOUSING ENVIRONMENTS OF MODERN AND CONVENTIONAL FARROWING PENS

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Background and Objectives

Genetic and environmental factors influence survival and vitality of piglets. We compare litters of German Saddleback (GS) and German Landrace (GL) pigs on vitality in pens and crates to describe genetic differences and the influence of production systems for piglet survival.

Material and Methods

GS sows (n = 17, parity 1–3) and GL sows (n = 26, parity 1–2) were housed in farrowing pens (5.8–6.5 m²) or crates (1.08–1.26 m²) on day 105 of gestation. Farrowing was not induced. Vitality of piglets was assessed via APGAR score modified according to Randal, time to first teat contact, and piglet losses on days 1 - 7.

Results

Breeds differed significantly for total born (GL: 14.5; GS: 11.8) and live born (GL: 13.6; GS: 10.8) piglets, (dead born piglets = DBP, GL: 0.54; GS: 0.35). Average birthduration was 261 ± 126 min (GL) and 172 ± 104 min (GS). GL-farrowing was more frequently affected by dystocia (GL: 61.5% vs. AS: 17.6%), defined as at least one interruption lasting 60 minutes or more, visible in crates (71.4%) and pens (54.5%). GL-litters with DBP had lower overall vitality scores, resulting in higher losses between days 1 - 3, which indicates a link to dystocia. In GS sows, larger litter sizes were associated with increased losses on days 1 - 3 ($p = 0.007$). Litters with higher losses between days 4 - 7 were associated with DBP ($p = 0.02$) and lower APGAR scores ($p = 0.005$).

Discussion and Conclusion

Farrowing process and piglet birthweight are the strongest predictors of piglet survival and vitality. In both breeds, housing had no effect on piglet losses within the first 7 days or the time to first teat contact. Dystocia in GL sows is connected to larger litter sizes and lower oxytocin levels, with negative effects for DBP, lower APGAR scoring and higher losses.

REP-PP-09

SINGLE FIXED TIME ARTIFICIAL INSEMINATION WITH TRIPTORELIN: IMPACT ON REPRODUCTIVE PERFORMANCE UNDER COMMERCIAL CONDITIONS IN A MULTIPLIER FARM.

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Background and Objectives

Single fixed-time artificial insemination (SFTAI) with intravaginal triptorelin has been mainly evaluated under experimental conditions. This study assessed its impact in a multiplier herd in the filling phase.

Material and Methods

A prospective field study with historical controls was performed in a multiplier farm. The treated group comprised 554 weaned sows (parities 2–3); the control group included 1,924 weaned sows bred under conventional heat detection. All sows had a 28-day lactation and an increasing feeding curve. Estrus detection was performed once daily using a teaser boar, based on standing reflex and typical vulvar signs. In both groups, intra-uterine inseminations (2.8×10^9 sperm per dose) were performed without boar presence. Control sows received two doses on consecutive days after estrus detection. In the treated group, eligible sows received intravaginal triptorelin 96 h post-weaning and were bred once 20–24 h later (SFTAI); those not in estrus on days 4–5 were bred with the conventional protocol. Of the 554 intended SFTAI sows, 468 were bred with the SFTAI protocol and 86 with the conventional system. Outcomes were wean-to-insemination interval (WII) and pregnancy rate at first diagnosis. A cost of 3€ per non-productive day was assumed.

Results

Pregnancy rates were high and similar (87.3 % SFTAI vs 87.2 % control), with no statistically significant differences in prolificacy. Mean WII was 4.95 days in the SFTAI group and 5.32 days in controls. The SFTAI protocol reduced semen use from 2.2 to 1.16 doses per sow. Considering semen savings, treatment cost and the reduction in WII at 3 €/day, the estimated net economic benefit was approximately 7 €/inseminated sow.

Discussion and Conclusion

Under multiplier-herd conditions in the filling phase, SFTAI with triptorelin maintained pregnancy rates, shortened WII and reduced semen use, providing a practical economic advantage for intensive breeding systems.

REP-PP-10

FARROWING LENGTH AND LACTATION METABOLIC PERFORMANCE IN SOWS SUBJECTED TO NATURAL HEAT STRESS AND TREATED WITH A SPECIFIC PREPARATION

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Background and Objectives

Natural heat stress is a major concern in countries with warm and subtropical climates, negatively affects sow metabolism and performance. This study evaluated the effect of a dietary feed supplement based on plant extract, vitamin C, and betaine, on different metabolism parameters of sows at farrowing and during lactation

Material and Methods

Sixty multiparous sows were assigned to groups control (CON, n = 30) and treatment (XTRA, n = 30), which received 1.5 L of product/ 1,000 L of weater for one week before farrowing and one week before weaning. The trial was conducted in Spain during July 2025. The body condition was measured using a caliper (CALIP), and backfat thickness (BFT) and loin depth (LD) were measured by ultrasound scanner before farrowing (CALP1, BTF1 and LD1) and at the end of lactation (CALIP2, BTF2, LD2). Sows were fed with automatic feeders. The onset and duration of farrowing were recorded. Rectal temperature was monitored for 3 days postpartum.

Results

There were no significant differences in CALIP, BFT, or LD. However, XTRA sows lost more backfat (XTRA = -0.48 mm vs. CON = 0.14) and there was a difference in DL2-DL1 (XTRA = -0.88 vs. CON = 0.138, p = 0.037). Differences were also observed in the onset of farrowing (12:27 vs 16:06, p=0.03). Moreover, rectal temperature on day 3 after farrowing was significantly lower in treated sows (XTRA=38.04 vs CON=38.4ºC, p=0.015). The duration of farrowing was reduced by almost two hours in treated group (XTRA=5:47 hours, CON=7:54). The sow's mortality was XTRA = 5.0% and CON = 6.7%.

Discussion and Conclusion

One of the effects of heat is difficulty in the liver's metabolism to maintain metabolic activity, which usually leads to fat accumulation. XTRA sows have consumed more fat, indicating that there has been no negative feedback from the mobilization of reserves. Shorter farrowing duration and earlier onset also reflect heat-stress reduction.

REP-PP-11

FIELD EVALUATION OF THE FARROWIN® APPLICATION FOR REDUCING STILLBIRTH RATES IN PIG HERDS

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Background and Objectives

Reducing stillbirth rates remains a key objective for improving reproductive efficiency and animal welfare in sow herds. FarroWin® application identifies sows at high risk of stillbirths, enabling targeted specific and tailor-made monitoring. This field trial aimed to evaluate the added value of FarroWin® in field conditions compared with standard practices.

Material and Methods

Data were collected from 1,100 sows across three commercial herds. Based on FarroWin® predictions, 247 sows were classified as "at-risk" (predicted stillbirth probability > 8%). Farmers applied a reinforced surveillance protocol to these sows, including continuous farrowing supervision, fever monitoring, and standardized obstetric interventions when indicated. Sows farrowing during the day (eligible for enhanced supervision) formed the supervised group, while those farrowing at night served as non-supervised controls. Baseline group comparability was verified (born alive and stillborn at previous farrowing, parity, and backfat thickness before farrowing) using Wilcoxon or t-tests. A generalized linear mixed model (GLMM, binomial family) was used to assess the effect of supervision, with herd and batch as random effects.

Results

FarroWin® application accurately predicted stillbirth risk at the population level: predicted vs. observed stillbirth rates were 6.05% predicted vs. 5.25% observed for low-risk sows, and 11.9% vs. 11.1% for high-risk non-supervised controls. Within the supervised group, sows showed a lower observed stillbirth rate (9.25%) than non-supervised controls (11.12%), indicating a beneficial effect of reinforced monitoring. The GLMM confirmed that reinforced monitoring significantly reduced stillbirth occurrence compared with standard management (Odds Ratio = 1.23, p = 0.044).

Discussion and Conclusion

These field results demonstrate the practical value of the FarroWin® application for identifying high-risk sows and guiding targeted interventions. Enhanced supervision of predicted high-risk sows significantly lowered stillbirth rates under commercial conditions, highlighting the potential of digital decision-support tools to improve reproductive outcomes and welfare in pig production.

REP-PP-12

TELEMEDICAL MANAGEMENT OF SEVERE POSTPARTUM HEMORRHAGIC VAGINAL DISCHARGE IN A MULTIPAROUS SOW – A CASE REPORT

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Background and Objectives

Postpartum hemorrhage is a well-recognized and potentially life-threatening complication in both animals and humans. This case report describes a primary postpartum hemorrhage in a multiparous sow managed in a free-farrowing system with the support of telemedicine.

Material and Methods

A 16-month-old Large White sow showed severe hemorrhagic vaginal discharge after the farrowing process. A thorough case history and visual examination of the animal using telemedical technique was conducted prior treatment.

Results

Farrowing began at 14:00 on a Saturday without hormonal induction, and the sow delivered eight live-born piglets by 16:30 without intervention. Overnight, no observations were made. At 04:30 the following morning, the sow was found with nine live-born piglets and one stillborn. During morning feeding, the farmer observed a large amount of blood on the pen walls and severe hemorrhagic vaginal discharge and contacted the veterinarian, initiating a telemedical consultation. Examination revealed a normal appetite, a body temperature of 38.4 °C, firm faeces without visible blood, and no external injuries to the tail, vulva, or vagina. No signs of ongoing labour were observed. Manual palpation of the birth canal was avoided due to the severity of bleeding. Transabdominal ultrasonography confirmed the absence of retained piglets. Telemedical evaluation indicated pallor, and the final diagnosis of uterine bleeding was made. Intramuscular administration of 30 IU oxytocin was recommended to stimulate uterine contractions and control the hemorrhage. During the follow up consultation one hour later, the farmer reported that the bloody vaginal discharge stopped within 15 minutes after oxytocin administration.

Discussion and Conclusion

This case documents primary postpartum hemorrhage in a free-farrowing sow, a condition not previously reported in the literature. It also illustrates the value of telemedicine in porcine health management, enabling timely assessment and intervention in life-threatening situations.

REP-PP-13

INFLUENCE OF A INTRAUTERINE PHYTOTHERAPEUTIC TREATMENT APPLIED AFTER FARROWING ON THE PUERPERIUM AND REPRODUCTIVE PERFORMANCE IN FREE FARROWING SOWS

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Background and Objectives

Phytotherapeutic agents offer a promising alternative to current conventional treatment after parturition. Therefore, the aim of this study was to evaluate the effect of an intrauterine application of a phytotherapeutic treatment on clinical parameters during the puerperium and on reproductive performance in the subsequent litter.

Material and Methods

The study included 151 sows housed in a free farrowing system. Animals were allocated to three groups: phytotherapy (300 ml EucaComp® diluted in 0.9% NaCl; n=50), placebo (300 ml 0.9% NaCl; n=50) and an untreated control group (n=51). The intrauterine application was performed once 3–12 hours after expulsion of the last placenta using an extended insemination catheter. Fever (body temperature of ε 40°C on the first day post-partum and/or ε 39.3°C on other days), feed intake (empty through within 1 hour), and vaginal discharge were recorded daily during the first seven days postpartum (discharge present during this period). In addition, performance parameters of the current litter and reproductive indicators of the subsequent litter were documented.

Results

Lack of appetite occurred significantly less frequently in the phytotherapy group compared to the control group (24% vs. 57%; p=0.001). No difference were found with the placebo group (38%). Pairwise comparisons revealed a significantly higher proportion of sows with vaginal discharge in the placebo group (90%) compared with both the phytotherapy group (70%; p = 0.023) and the control group (73%; p = 0.040). No significant differences were observed in the incidence of fever (34% vs. 38% vs. 35%; p = 0.913). Litter performance parameters and reproductive outcomes in the subsequent cycle did not differ significantly between groups.

Discussion and Conclusion

Intrauterine application of EucaComp® significantly improved feed intake without adversely affecting reproductive performance. The phytotherapeutic treatment may therefore represent a useful adjunct or alternative to conventional treatment approaches.

REP-PP-14

OPTIMIZED NO-ORIENTING NOZZLE FLOW CYTOMETRY GATING STRATEGY FOR THE IDENTIFICATION AND X/Y DISCRIMINATION OF BOAR SPERMATOZOA

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Background and Objectives

Flow cytometry, commonly used for boar semen sexing, requires costly orienting-nozzle instruments and is limited by debris and sperm agglutination which overlap target signals, constraining its applications in research and diagnostics. Here, we developed an optimized gating strategy for non-orienting flow cytometers to select the target sperm population and discriminate X and Y chromosome bearing spermatozoa through Hoechst 33342 fluorescence.

Material and Methods

Semen samples from eight Duroc boars were diluted to 5×10^6 sperm/mL, washed, stained with Hoechst 33342 at 7 ⌈g/mL (determined through calibration curve) and incubated at 37°C for 10 minutes. Samples (200 ⌈L/well) were analyzed in duplicate on a NovoCyte3000 (Agilent®) flow cytometer with low flow rate, recording 30,000 events in the main gate. Gating refinement was based on Forward (FSC) and Side Scatter (SSC) parameters, by area (A) and height (H), wich describe particle size and complexity. Fluorescence was detected in the Pacific Blue channel (⌊ex: 405 nm; ⌊em: 445/45 nm). Statistical analysis was performed with RStudio (v2025.09.2+418).

Results

The first FSC-A/SSC-A gate enabled the exclusion of debris from the sample. A secondary gate in the FSC-A/FSC-H plot allowed the removal of aggregates, ensuring the selection of the target population that was finally observed in the FSC-A/Pacific Blue-A plot. Fluorescence detection revealed two distinct peaks corresponding to X and Y spermatozoa, respectively. Relative standard deviation (RSD) showed minimal variability between replicates of each boar (RSD < 3%) and among different boars (RSD 10-15%), indicating intra- and inter-sample reproducibility. Statistical analysis confirmed no significant differences in X:Y proportion among ejaculates ($p = 0.995$).

Discussion and Conclusion

This gating strategy provides a reproducible method for the identification and discrimination of X/Y spermatozoa in a single analysis using non-orienting instruments, supporting the development of accessible diagnostic and analytical methods for swine research and production.

REP-PP-16

ANEMIA IN LATE-GESTATION SOWS: PREDISPOSING FACTORS AND IMPACT ON HEALTH AND REPRODUCTIVE PERFORMANCES

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Background and Objectives

The literature reports inconsistent definitions of anemia in sows, with hemoglobin thresholds commonly set below either 10 or 11 g/dL. This study consisted of two parts: a retrospective analysis to identify predisposing factors associated with low hemoglobin concentrations at the end of gestation, and a prospective study to evaluate its impact on sow and litter health and reproductive performances.

Material and Methods

Hemoglobin concentration was measured five days before farrowing in 988 sows from six French farms representing diverse genetic backgrounds. Previous reproductive performances data were
analysed to identify predisposing factors for anemia using ANOVA or Kruskal-Wallis tests. Reproductive parameters from the current cycle were examined to assess the impact of anemia using Student's t-tests and Wilcoxon tests.

Results

Principal component analysis supported the grouping of hemoglobin values below with those between 10 and 11 g/dL, leading to the definition of anemia as hemoglobin concentrations below
11 g/dl. Sixty-five percent of the sows were classified as anemic before farrowing. Older parities (≥3) and lower backfat thickness at farrowing (<15mm) had significantly lower hemoglobin
concentrations ($p<0.01$). During the previous cycle, anemic sows had more total born piglets (17.81±3.68 vs 17.22±3.34; $p=0.03$) and higher stillbirth rates (5.8%vs4.3%; $p=0.004$). In the current cycle, anemia was associated with a shorter gestation length (115.25±2.05 vs 116.29±1.54 days, $p<0,01$), more total born piglets (17.79±3.61 vs 17.23±3.67, $p=0.02$), higher stillbirth rates (7.6%vs5.8%, $p=0.002$), fewer weaned piglets (13.54±2.14 vs 14.01±1.75; $p<0.01$) and a longer weaning-to-first-mating interval (4.87±1.54 vs 4.82±1.91 days; $p=0.02$).

Discussion and Conclusion

This study supports the use of 11 g/dL as a relevant threshold to define anemia in sows. Anemia negatively affects reproductive performance by increasing stillbirth rates and reducing the
number of weaned piglets as described in the literature. Additionally, this study highlights for the first time the association between anemia, shortened gestation length, and prolonged weaning to-first-mating interval.

REP-PP-17

DRINKING-WATER SUPPLEMENTATION ENHANCES REPRODUCTIVE PERFORMANCE IN SOWS EXPOSED TO NATURAL HEAT STRESS

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Background and Objectives

Natural heat stress is a major concernment in countries with warm and subtropical climates, negatively affecting the metabolism and performance of sows. This study evaluated the effect of a dietary feed supplement based on plant extract, vitamin C, and betaine, on the reproductive performance of sows.

Material and Methods

Sixty multiparous sows were assigned into two groups a control (CON, n=30) and a treatment group (XTRA, n=30) that received 1.5 L of product/1,000 l water for one week when entering the farrowing unit and one week before weaning. The trial was conducted in Spain during July 2025. For each farrowing, the following parameters were recorded: prolificacy (percentage of liveborn, stillborn, mummified over total born piglets and weaned piglets over cross-fostered piglets), piglet growth, weaning-to-mating interval (WSI), percentage of empty sows after insemination.

Results

The percentage of liveborn piglets over total born piglets was XTRA = 86.4% vs. CON = 84.8%. Stillborn XTA = 8.6% vs. CON = 10.9% and Mummified XTRA = 4.3% vs. CON = 5%. The percentage of weaned piglets was XTRA = 91.7% vs CON = 88.5%. Litter weight was significantly higher after farrowing, 3.34 kg more, on average, in the XTRA group (p=0.025). The WSI was XTRA = 4.2 vs. CON = 4.5 days, and empty after mating sows was XTRA = 0% vs. CON = 7%. Litter weight at farrowing was significantly higher in the XTRA group, averaging 3.34 kg more than the control group (p = 0.025). The WSI was shorter in XTRA (4.2 days) compared with controls (4.5 days).

Discussion and Conclusion

Sows receiving the dietary feed supplement (XTRA group) showed improved reproductive parameters compared with the control group. Particularly noteworthy is the higher percentage of weaned piglets and sows fertility (WSI and empty sows), suggesting that the supplement may help mitigate the negative effects of heat stress on sow productivity.

VPH-PP-01

QUANTITATIVE CORELATION BETWEEN PORCINE RESPIRATORY DISEASE COMPLEX AND CARCASS PERFORMANCE- A MIXED-MODEL ANALYSIS.

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Background and Objectives

Porcine respiratory disease complex (PRDC) significantly impacts the swine industry worldwide, leading to economic losses due to poor growth performance, reduced feed efficiency, higher medication costs, and reduced carcass quality parameters. Cranio-ventral pulmonary consolidation (CVPC) and pleuritis are the most frequent macroscopic lung lesions observed in PRDC. This study aimed to quantify the effects of CVPC and pleurisy on carcass weight, meatiness, and average daily carcass weight gain (ADCWG) in fattening pigs.

Material and Methods

A total of 679 slaughtered pigs from seven batches (farms) were evaluated for severity of lung lesions at slaughter using the Madec and Kobisch (1982) methodology. A mixed-model analysis was employed to assess the correlation between lung lesions severity and production parameters across the farms.

Results

The mean prevalence of lesions was 23.86% for CVPC and 15.46% for pleurisy, indicating a significant presence of respiratory disease affecting animal welfare. Pigs with severe lung lesions (ε 15.1%) exhibited significantly lower ADCWG compared to pigs without lesions (0.951 kg/day vs. 0.997 kg/day, $p = 0.024$), reflecting reduced growth performance and welfare. The mixed-effects model revealed that lesions in the right apical lobe and dorso-caudal pleurisy were associated with significant reductions in carcass weight (− 2.77 kg and − 2.29 kg, respectively) and carcass meat (− 1.76 kg and − 1.43 kg, respectively). An economic analysis under average market price conditions demonstrated that severe lung lesions could lead to financial losses of up to 11.53 EUR per 100 kg of meat, emphasizing the economic impact of compromised welfare due to respiratory diseases.

Discussion and Conclusion

This study provides quantitative evidence of the negative impact of CVPC and pleurisy on carcass weight and meatiness in fattening pigs. The findings underscore the importance of effective respiratory disease management in swine production, highlighting potential areas for targeted interventions to improve animal health and economic outcomes.

VPH-PP-03

DETECTION AND SUBTYPING OF BLASTOCYSTIS SPP. BY METABARCODING ANALYSIS IN ITALIAN PIGS

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Background and Objectives

Blastocystis sp. is among the most common enteric protists in humans and animals; however, its occurrence, subtype distribution, and role within the gut microbiota remain poorly understood. Although it is often considered a commensal organism, several studies in pigs have reported its occurrence in association with gastrointestinal symptoms, suggesting a potential, yet still debated, role in enteric disorders. This study investigated its prevalence, subtype diversity, and associations with gut microbial communities in Italian pigs.

Material and Method

A total of 128 faecal samples from 22 fattening pig farms (northern Italy) were analysed using a quantitative copromicroscopic examination and amplicon-based next-generation sequencing (NGS) metabarcoding approach.

Results

All samples tested positive, exhibiting either single or mixed infections involving five subtypes (ST1, ST2, ST3, ST5, and ST15). ST5, considered pig-specific, was the most prevalent (78.9%), followed by ST1 (75.0%) and ST3 (45.3%), whereas ST2 and ST15 were less frequent. Age significantly influenced microbial ⟨-diversity and subtype carriage: older pigs showed higher richness and were predominantly colonized by ST5. Nematodes, more prevalent in older pigs, were often detected alongside ST5, suggesting potential interactions between helminths and Blastocystis sp. in modulating gut microbiota. Bacterial composition also varied according to age and subtype. In particular, older pigs exhibited higher relative abundance of Alloprevotella spp., Prevotella spp., and Faecalibacterium spp., while younger animals showed a more heterogeneous microbial profile.

Discussion and Conclusion

This is the first comprehensive assessment of Blastocystis sp. in pigs raised in northern Italy, revealing high prevalence, frequent mixed infections, and subtype-specific associations with the gut microbiota. These findings provide a foundation for future research on Blastocystis sp., aimed at elucidating its pathogenicity, zoonotic potential, and the origins of the subtypes detected in pigs, and highlight the utility of advanced molecular techniques for resolving intra-host subtype diversity and exploring interactions between the parasite and the gut microbial community.

VPH-PP-04

WILD BOARS AS ONE HEALTH SENTINELS: MINIMAL ANTIMICROBIAL RESISTANCE IN E. COLI FROM WILD HABITATS

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Background and Objectives

Monitoring antimicrobial resistance (AMR) in wild suids is essential within a One Health framework, especially in regions where interactions with livestock may influence the circulation of resistance determinants. Escherichia coli is considered a reliable sentinel organism for assessing antimicrobial selective pressures in both livestock and wildlife. As part of a Spanish project evaluating the impact of livestock in the health status of wildlife populations, this study evaluated the antimicrobial susceptibility of E. coli isolated from wild boars inhabiting remote areas and those close to livestock.

Material and Methods

Swabs from various anatomical locations (i.e., liver, spleen, kidney, and lungs) from wild boars (n = 97) were collected during hunting activities and cultured on blood agar for 24 hours at 37 °C under aerobic conditions. Colonies of interest were purified and identified using MALDI-TOF. A total of 33 E. coli isolates were selected for susceptibility testing using Sensititre EUVSEC3 plates and following manufacturer guidelines. The plates included 15 antimicrobials relevant to porcine health, enabling determination of minimum inhibitory concentrations (MICs) interpreted using ECOFF breakpoints to classify isolates as wild-type (WT) or non-wild-type (NWT).

Results

All isolates were categorized as WT for the evaluated antimicrobials. MIC patterns showed growth at low concentrations for several antimicrobials, including ampicillin, azithromycin, cefotaxime, ceftazidime, sulfamethoxazole and trimethoprim, although none exceeded ECOFF thresholds. Ciprofloxacin MICs were particularly low, clustered at 0.015 – 0.03 ⌈g/mL. For carbapenems, aminoglycosides, tigecycline and colistin, no growth occurred beyond the lowest wells, indicating a highly susceptible phenotype.

Discussion and Conclusion

Overall, these findings align with recent European reports describing minimal AMR in E. coli from wild boars with limited exposure to anthropogenic antimicrobials, supporting the idea that wild populations may represent baselines of unselected microbial communities and providing a useful reference for comparisons with livestock.

VPH-PP-05

CURRENT SITUATION OF SALMONELLA SPP. IN SWISS PIG HERDS

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Background and Objectives

Salmonella spp. are important bacteria that can affect both animals and humans. Some serotypes can lead to severe disease in pigs and also cause foodborne illness. In Switzerland, salmonellosis is a regulated and a notifiable animal disease, but unlike many neighboring countries, there is no national monitoring program. Previous studies based on slaughterhouse samples have suggested that Salmonella infection is relatively uncommon in Swiss pig herds.

Material and Methods

The present study aimed to provide an updated dataset by analyzing fecal samples submitted for routine diagnostic testing. Using standard laboratory methods, including enriched-based culture, selective agar and serotyping, a total of 1143 samples collected in 2023/2024 were examined. In order to comply with data protection law and other Swiss regulations, all samples were submitted to us anonymised apart from 'age category' and 'herd / submission date'.

Results

The majority of samples were derived from suckling and weaned pigs. Salmonella was detected in 5 samples (0.4%) originating from weaners. One isolate belonged to Salmonella enterica subsp. enterica serotype Enteritidis, a serovar relevant for food safety, while the other four were classified as Salmonella enterica subsp. diarizonae serotype 61:k:1,5,(7). All positive cases came from weaning piglets in two different farms.

Discussion and Conclusion

These findings support previous data showing that the overall prevalence of Salmonella in Switzerland is lower than in other countries such as Germany, France, or Italy. Nevertheless, the detection of Salmonella, even at low levels, underlines that risks for animal health and food safety remain.Continued surveillance, including structured surveys and ongoing monitoring supported by serotyping and molecular epidemiological characterization of the strains, will be important to better understand the role of Salmonella in Swiss pig herds and to ensure both safe food production and healthy animals.

VPH-PP-08

RISK ASSESSMENT FOR BRUCELLA SUIS BIOVAR 2 IN DANISH PIGS

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Background and Objectives

In Denmark, the number of uncastrated finishing pigs is on the increase, due to a wish to improve animal welfare and productivity. According to EU legislation, all parts of a slaughter animal must be subjected to official inspection, with the penis as an exception if already discarded. The question is how the testicles could be inspected in a cost-effective way. But what is in fact the risk associated with not detecting abnormal testicles for people working with pigs and consumers eating pig meat?

Material and Methods

To address this, we undertook a semi-quantitative risk assessment following WOAH guidelines, assuming two different transmission pathways (contact/meat-borne) and two different pig populations (indoor/outdoor) using Denmark as a case.

Results

Brucella spp. was identified as the only public health hazard. Brucellosis is a notifiable zoonotic infection, among others resulting in enlarged testicles in infected boars. Denmark is officially free from B. abortus and B. melitensis, whereas B. suis biovar 2 has been detected on a few occasions during the last 50 years. In August 2025, a new case was detected in an outdoor pig farm. No human cases have ever been detected in Denmark, and only few cases are found elsewhere. Pig meat is not ascribed to transmission of infection unless the meat comes from acutely infected animals.

Discussion and Conclusion

The human health risk related to B. suis biovar 2 was assessed as low in case of contact with outdoor-reared pigs and negligible for the meat-borne route and contact to indoor raised pigs. Therefore, pig producers and veterinarians should focus on outdoor-raised pig production and react immediately upon presence of relevant symptoms such as enlarged testicles or abortions making use of relevant laboratory diagnostics. At the abattoir, computer vision systems could be considered as diagnostic tools to help meat inspectors in detecting enlarged testicles in a cost-effective way.

VPH-PP-09

THE IMPACT OF DIETARY PROBIOTIC CLOSTRIDIUM BUTYRICUM SUPPLEMENTATION ON SOW COLOSTRUM METABOLOMIC PROFILES

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Background and Objectives

Probiotic Clostridium species have been recognized for their ability to enhance gut integrity and improve nutrient absorption, serving as alternatives to antibiotic growth promoters in swine production. Despite extensive research on their gastrointestinal benefits, limited information exists regarding their influence on colostrum composition. Therefore, this study aimed to investigate the effect of C. butyricum supplementation in sows on the colostrum metabolomic profile.

Material and Methods

Fourteen Landrace × Yorkshire sows were assigned to either a control group (n=7; three primiparous and four multiparous) fed a standard diet or a treatment group (n=7; three primiparous and four multiparous) fed the same diet supplemented with 10 g/sow/day of C. butyricum spores (Top Gut®, Huvepharma Ltd., Bangkok, Thailand) from day 109 of gestation to weaning (29.6±4.8 days). The probiotic contained 5×10^9 CFU viable C. butyricum spores/10 g. Colostrum was collected within 1 h postpartum, and non-volatile polar metabolites were profiled using non-targeted ^{1}H-NMR spectroscopy coupled with chemometric analysis, with probiotic supplementation and parity (primiparous vs. multiparous) used as factors.

Results

Comparative metabolomic profiling revealed distinct clustering of samples influenced by both probiotic supplementation and sow parity. The effect of C. butyricum supplementation was most pronounced in the colostrum metabolome of primiparous sows, which exhibited higher relative abundances of carnitine, biotin, threonine, lactate, choline-derived compounds, acetylcarnitine, and alanine ($p < 0.05$). Pathway impact analysis further indicated that these alterations were primarily associated with amino acid, carbohydrate, biotin, and selenocompound metabolism in Sus scrofa.

Discussion and Conclusion

Colostrum composition reflects circulating maternal metabolites and is diet-dependent. Accordingly, primiparous sows receiving probiotic supplementation appear more responsive than multiparous sows, potentially due to enhanced digestive efficiency and nutrient absorption associated with probiotic activity and continued gastrointestinal tract maturation. These observations suggest that C. butyricum supplementation may improve maternal digestive function and, subsequently, modulate colostrum metabolomic profiles.

VPH-PP-10

RAPID DETECTION OF SALMONELLA SHEDDING IN PIG BATCHES AT SLAUGHTERHOUSE ARRIVAL USING LAMP PCR

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Background and Objectives

Salmonella spp contamination is a major concern in pig farm and slaughterhouse. The early identification of pig batches with high Salmonella shedding at slaughterhouse arrival is essential reduce carcass contamination. Conventional microbiological methods require up to two days to provide results. LAMP PCR technology, performed without a pre-enrichment step, allows detection of Salmonella DNA within 35 minutes and could enable rapid pre-slaughter corrective interventions.

Material and Methods

The LAMP PCR test was compared with a standard quantitative PCR to assess its ability to detect four Salmonella strains isolated from the pig and pork sector at concentrations ranging from 10^7 to 10^0 CFU/g, in order to determine the limit of detection. The LAMP PCR test was further compared with Salmonella enumeration performed according to ISO/TS 65779-2:2012, to assess its ability to identify pig batches with high shedding levels. Twenty analyses were performed using two pools of six pig fecal samples per batch.

Results

Both LAMP PCR and quantitative PCR detected Salmonella genomic DNA with similar limits of detection (10^3 or 10^2 CFU/g depending of the strain). LAMP PCR reliably detected high Salmonella concentrations (>440000 NPP/g). No false positive results were observed. At lower contamination levels, sensitivity decreases as bacterial load declined.

Discussion and Conclusion

LAMP PCR enables the detection of Salmonella DNA in pig feces within 35 minutes. This method allows rapid identification of highly contaminated pig batches at slaughterhouse arrival using pool of six pig fecal samples. LAMP PCR therefore represents a promising tool for risk-based batch classification and the implementation of rapid pre-slaughter corrective measures.

VPH-PP-11

DOMESTIC PIGS USED IN A MANAGEMENT CONCEPT FOR YELLOW NUTSEDGE (CYPERUS ESCULENTUS L.): FEEDING ACCEPTANCE BY SOWS AND POST-DIGESTIVE VIABILITY OF EXCRETED TUBERS

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Background and Objectives

Yellow nutsedge (Cyperus esculentus L.) is an increasingly problematic invasive weed in Lower Saxony, Germany, due to its rapid spread and resistance to conventional control. As there are no suitable measures for complete control, the EIP agri project "Systemic neophyte management concept for Lower Saxony in the area of yellow nutsedge" will investigate the use of domestic pigs as a potential biological control agent. This preliminary study evaluated the acceptance of yellow nutsedge by sows and the germination capacity of digested and excreted tuber components.

Material and Methods

A group of 30 sows was fed separately with leaves, rhizomes, and tubers of yellow nutsedge on alternating days within a 10-week-period. Feed intake was recorded by comparing individual portion weights before and after feeding. Faecal samples were collected, washed trough analytical sieves, and inspected for tuber residues. Untreated faecal material and washed tuber fragments were planted in a greenhouse to assess germination capacity after digestion.

Results

Acceptance of the plant components showed considerable individual variability. Grass was consumed most readily, followed by rhizomes and tubers, but no component was consistently accepted by all animals. Faecal analysis revealed tuber fragments of various sizes as well as apparently intact, whole tubers. No germination occurred from untreated faeces or washed fragments within nine weeks. In contrast, fully intact excreted tubers germinated one week after planting.

Discussion and Conclusion

Under the conditions tested, the results indicate possible limitations in controlling yellow nutsedge using pigs as the sole measure. The moderate acceptance and the survival of intact tubers through the digestive tract pose a potential risk for further spread. Since this study was conducted under barn conditions and represents only a single preliminary feeding trial, environmental factors and habituation effects could not be assessed. Field trials are planned to evaluate the practical relevance and safety of using pigs to manage yellow nutsedge.

VPH-PP-12

SEROPREVALENCE OF TOXOPLASMA GONDII IN PIGS ACROSS POLAND

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Background and Objectives

Toxoplasmosis is a significant zoonosis worldwide. Although infection with Toxoplasma gondii (T.gondii) rarely results in clinical signs in pigs, consuming pork containing cysts represents a potential threat to human health. Poland is a important pig producer in the EU; therefore, to assess the potential threat to consumers, this study evaluated the presence of anti-T. gondii antibodies in pigs originating from different regions of Poland

Material and Methods

Blood was obtained from pigs raised on 16 commercial farms located in 9 provinces of Poland. The farms varied in size, production type, health, and hygiene status. For the study, farms were classified into 3 categories, based on the number of sows: 200 (n = 4), 200–1000 (n = 5), and ε 1000 (n = 6). In total, 1034 serum samples from 259 piglets, 220 weaners, 243 fatteners, 70 gilts, and 243 sows were analysed via commercial ELISA tests. Differences in seroprevalence across different age categories, provinces, and farm sizes were assessed using the chi-square test, with p-values considered significant at $p < 0.05$.

Results

Specific antibodies were detected in 11.3% serum samples and in 56.25% of analysed farms, respectively. The highest seroprevalence was observed in sows (28.1%), which was significantly higher than in the remaining age groups ($p < 0.05$). Among the analysed provinces, the highest proportion of seropositive pigs was found in Kujawsko-Pomorskie and Podlaskie (33.3%); meanwhile, in Łódzkie, Pomorskie, and Warmińsko-Mazurskie, none of the analysed samples tested positive. Seroprevalence among the analysed farm sizes differed significantly ($p<0.05$), being the lowest and highest in the largest (2.53%) and smallest farms (30.88%), respectively.

Discussion and Conclusion

In conclusion, the current study updates the data on the seroprevalence of T. gondii in the Polish pig population across different age categories and provinces, indicating a potential health risk to consumers.
This study was supported by grant 506.514.05.00 (from our Faculty)

VPH-PP-14

IMPROVEMENT OF PERFORMANCE DATA AND SLAUGHTERHOUSE MONITORING AFTER INTRODUCTION OF A NEW COMBINED INTRADERMAL PRRS, PCV MHYO AND LAWSONIA VACCINATION SCHEDULE

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Background and Objectives

Due to the widespread prevalence of PCV2, Mhyo, PRRSV, and Lawsonia in northwest Germany, vaccination programs are widely established. With the introduction of an intradermal vaccine combination of PCV and Mhyo, Lawsonia, and concurrent PRRS administration, producers' interest increased, anticipating strong protection and benefits in terms of labor, animal welfare, and hygiene. The aim of this field observation was to examine the effects of this vaccination concept on animal performance and lung health.

Material and Methods

On a farrow to finish farm with established vaccinations against Mhyo (i.m., 1st-woa), PRRS and PCV2 (i.m., 3rd-woa) and Lawsonia intracellularis (orally, 7th-woa) it was decided to switch to the combined intradermal vaccination (IDAL®Twin device). Porcilis®PCV M Hyo ID + Porcilis®Lawsonia ID were mixed and administered in parallel with Porcilis®PRRS (i.d., 4th-woa). Finishers before (n=1516) and after vaccination change (n=1078) were monitored for clinical and production-related parameters and by slaughterhouse checks for lung health (Madec, SPES).

Results

With the new combined intradermal vaccination, the clinical situation remained stable. Finisher losses decreased from 1.27% to 0.94% (-0.26%). The Madec score dropped by 68% (4.63 to 1.48). The proportion of animals without lung lesions increased from 24.4% to 70.1%, and without pleurisy from 93.3% to 98.7%. ADWG decreased insignificantly (920.3 vs. 900.6 g/d), but FCR improved significantly from 1:2.63 to 1:2.51 (-1:0.12). This means a benefit of €3.38/100 kg by reduced losses and improved FCR.

Discussion and Conclusion

The primary drivers for change on this farm were the stress experienced by piglets due to repeated intramuscular and oral drench vaccinations, the pursuit of an optimal combined vaccination schedule, and the associated labor demands. Furthermore, the introduction of the new combined intradermal vaccination procedures for PCV Mhyo, Lawsonia and PRRSV, improved clinical herd health and associated parameters, as well as economics.

VPH-PP-15

EFFECTS OF DIET DENSITY AND PHYTATE-PHOSPHORUS LEVELS ON THE EFFICACY OF PHYTASE SUPPLEMENTATION IN WEANING PIGLETS

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Background and Objectives

Minerals are essential in maintaining optimal growth performance and bone health. The objective of this study was to investigate the effects of diet density, phytate-phosphorus (PP) level and the supplementation of a new bacterial 6-phytase (PHY) on growth performance and bone mineralization in weaned piglets from 33 to 75 days of age.

Material and Methods

A total of 192 male piglets with initial weights of 8.47±0.70 kg were distributed in a 3 x 2 factorial arrangement. Three basal diets (BD), control (NE = 2448 and 2412 kcal/kg, dig. Lys = 1.35 and 1.23%, STTD P = 0.40 and 0.33%, total Ca = 0.80 and 0.70% in phases 1 and 2, respectively; PP = 0.23%), low energy and nutrients (control minus 70 kcal NE/kg, 0.15% points in both STTD P and total Ca; PP = 0.23%), and low energy and nutrients plus high PP (control minus 70 kcal NE/kg, 0.15% points STTD P and total Ca; PP = 0.29%) with or without the inclusion of phytase (0 or 1000 FTU/kg) were used.

Results

Significant interactions ($P<0.05$) were observed between BD and PHY inclusion on final BW, ADG, F:G ratio, and ash and P contents in metacarpal bones. The PHY addition in both nutrient-reduced diets improved final BW, ADG, F:G ratio, and bone mineralization, while no improvements ($P>0.05$) were observed on these parameters by PHY supplementation in the adequate diet. There was no significant interaction between BD and PHY inclusion on ADFI ($P>0.05$). Reduction in energy and nutrients without or with increasing dietary PP decreased the ADFI ($P=0.02$), compared to the adequate-nutrient diet. However, the addition of PHY improved ADFI ($P=0.03$).

Discussion and Conclusion

The present study's results demonstrated that the new bacterial 6-phytase was more effective in low-energy and -nutrient weaned piglet diets.

VPH-PP-16

SALMONELLA ANTIBODY DEVELOPMENT IN A LAWSONIA INTRACELLULARIS I.D. VACCINATED HERD

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Background and Objectives

The ubiquitous Salmonella infections in German fattening pig farms are monitored with an antibody (AB) monitoring program (Quality**&**Safety GmbH; QS), which closely correlates with infection rates and risk of food contamination (categories Cat I:low, II:medium, III:high). Practitioners describe that Lawsonia intracellularis (LI) vaccination can improve the Salmonella AB status. The objective of this field case was to monitor clinical Lawsonia infection and the development of Salmonella ABs following intradermal (id) LI vaccination in an affected farm.

Material and Methods

In a farrow-to-finish herd the Salmonella categorization worsened to Cat II since 12/2023 in parallel to clinical LI-diarrhea. As reaction piglet vaccination with Porcilis®Lawsonia ID was added to Porcilis®PCV ID/M.hyo ID ONCE (no further Salmonella specific measures). Sampling and testing plan: Salmonella direct detection: microbiology (dust/fecal samples, nursery/finishing); LI/Brachyspira pilosicoli (BP): PCR (feces, nursery/finishing); Salmonella: ABs Elisa (positive ODs=>40); serum (nursery n=160; early/mid/end finishing n=95 each) and meat juice (2023: n= 79; 2024: n= 82).

Results

With LI -vaccination diarrhea clearly improved, animal losses decreased (-40%) and ADWG of finishers increased (16 g/d). Salmonella and BP were not detected directly in any age group. LI was negative in feces of nursery and partly positive in unvaccinated/vaccinated finishers. All Salmonella serum ODs were <40 in nursery (0/160) and early finishing (0/95). OD-values =>40 were seen more often in mid (8/25) and end (14/25) finishing before LI-vaccination (11/2023-03/2024). With LI-vaccination ODs =>40 were reduced in mid (0/70) and end (1/70) finishers (04/2024-11/2024). The number of positive meat juice samples (Q3 2023-Q1/2024 19/59) decreased (Q2-Q4/2024 3/61) and farm returned to Cat I.

Discussion and Conclusion

These results indicate that in finisher farms with notable Salmonella antibodies, LI may be a co-factor. LI-vaccination was here able to improve diarrhea, biological performance and the Salmonella antibody development.

VPH-PP-17

PERSPECTIVES ON ANIMAL HUSBANDRY AND ANTIMICROBIAL USE AMONG SWISS LIVESTOCK FARMERS

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Background and Objectives

Antimicrobial use (AMU) in livestock is a public health concern due to its contribution to antimicrobial resistance. Understanding farmers' everyday realities and the factors that affect their AMU decisions is crucial for designing targeted interventions. This study investigates farmers' views on animal husbandry and AMU, with a particular focus on the differences between farms housing single-species or mixed-species.

Material and Methods

We conducted semi-structured telephone interviews with Swiss livestock farmers from cattle, pig, and mixed-species farms.

Results

In total, 27 Swiss livestock farmers were interviewed, representing twelve cattle farms, four pig farms, and eleven mixed farms housing both species. The thematic analysis revealed four major themes: animal health and welfare, factors influencing AMU, treatment practices, and perceived challenges. Differences in thematic emphasis were observed between farm types and between farms with or without AMU in dairy cattle or pigs. Most farmers described animal health as a central motivation in their daily work, and this was similarly expressed across all groups. Monitoring and control of animal health, was perceived as the main factor in the farmers responsibility influencing AMU. Infrastructure such as barn conditions and biosecurity measures were considered more important by pig farmers than by farmers housing cattle. Treatment strategies ranged from conventional to complementary methods, with homeopathy and herbal remedies being more common among cattle farmers. Economic pressure was the most frequently perceived challenge, though regulatory burden and public image of agriculture were more often raised by pig farmers.

Discussion and Conclusion

Swiss farmers' attitudes toward animal husbandry and AMU are influenced by species-specific demands, individual experience, and external constraints. While farmers emphasized their responsibility for animal health and welfare, their scope for action was limited by time, finances, and bureaucracy. The results underscore the importance of supportive policy frameworks to foster sustainable practices and effectively reduce AMU.

VPH-PP-18

CAN ALTERNATIVE SOURCES OF PROTEINS INFLUENCE A PRODUCTION OF GREEN-HOUSE GASES? A STORY OF LUPINE.

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Background and Objectives

Pork production is an important source of greenhouse gas (GHG) emissions. This pilot study tested the hypothesis that dietary composition can influence intestinal gas production. The aim was to evaluate whether partial replacement of soybean meal with white lupine meal could reduce GHG production without negatively affecting health or zootechnical parameters.

Material and Methods

Twenty-seven pigs (body weight from approx. 67 to 115 kg) were divided into three groups: control, 25% replacement, and 50% replacement (n = 9 per group). Every group was housed in three separate rooms, with three pigs per pen. Body weight was recorded on days 14 and 28 to calculate average gain and feed conversion ratio. Digestibility was determined using Cr2O# as an indicator. Faecal samples were collected to assess changes in intestinal microflora. Haematological and biochemical parameters were analysed from blood samples. After the fattening period, all animals were slaughtered and basic carcass parameters were evaluated. Methane and CO2 concentrations in the stable environment were monitored during the experiment. Statistical analysis performed using nonparametric unpaired tests did not show statistical significance.

Results

The 50% replacement group showed a 2 kg higher total average weight gain compared to the control group. Feed conversion improved by 0.16 kg/kg and 0.08 kg/kg gain in the 50% and 25% replacement group, respectivelly. Digestibility was higher in both lupine-fed groups. No differences were observed in slaughter classification, carcass weight, muscle mass, fat thickness, or haematological and biochemical parameters. Methane and CO2 concentrations were lower in the lupine-fed rooms. The lupine diet was associated with enrichment of Terrisporobacter and Prevotella in feces, taxa linked to reduced GHG production.

Discussion and Conclusion

White lupine can be considered a suitable alternative to soybean meal, improving feed efficiency and reducing GHG emissions, likely through modulation of intestinal microbiota. The study was supported by QL24020427.

VPH-PP-19

BIOSECURITY CHALLENGES FOR SMALL-SCALE PIG FARMS: NATIONAL DEFINITIONS AND LEGAL REQUIREMENTS

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Background and Objectives

Small-scale pig farms are vital for food security but often have lower biosecurity levels, increasing the risk of disease spread and compromising animal and public health. Yet, little is known about how biosecurity is regulated for these farms across Europe or how they are defined in national legislation.

Material and Methods

The EU-funded COST Action BETTER (CA20103) consortium collected data using a participatory research approach. One questionnaire explored national definitions of small-scale pig farms while a second questionnaire mapped the biosecurity measures mandated by national legislation, covering 41 pre-listed biosecurity measures. Data on the biosecurity implementation on small-scale pig farms was obtained from the Biocheck.Ugent database outside of the project.

Results

Validated data from 17 European countries were included. Most countries distinguished smaller farms from intensive operations using criteria such as the purpose of keeping pigs (e.g., self-consumption) and/or the number of animals kept, without explicitly using the term 'small-scale farm'. The number of mandatory biosecurity measures for this type of farms varied greatly, from two in Ireland to 29 in Italy, and in some countries these measures applied to all pig holdings rather than specifically to small-scale farms. National legislation in all countries prohibited feeding pigs with household leftovers, and none mandated a sanitary break in the farrowing unit after cleaning and disinfection. Biocheck.Ugent data from 96 small-scale pig farms in seven European countries on 25 November 2025, showed an average total biosecurity score of 61.7%, with 59.9% for the external and 65.8% for internal biosecurity.

Discussion and Conclusion

There is considerable heterogeneity in national definitions of small-scale pig farms, and mandatory biosecurity measures are rarely tailored to this sector. Clear definitions are essential to ensure that biosecurity standards adequately cover all farm types.

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VPH-PP-20

METHIONINE HYDROXY ANALOGUE BIS-CHELATES INFLUENCE PATHWAY ACTIVATION SIGNATURES ASSOCIATED WITH SURVIVAL AND EFFICIENCY

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Background and Objectives

Trace mineral choice is essential for pig health and sustainability. Methionine hydroxy analogue bis-chelate (MHAC) trace minerals reduce morbidity and mortality, improve percentage of pigs to primary market, and reduce mineral excretion. The study objective was to utilize metabolic pathway activation signatures determined by differential gene expression in blood to elucidate the MHAC mode of action in growing pigs.

Material and Methods

Blood from 1 barrow and 1 gilt per pen was taken from 21 pens per treatment after 52-d (75 kg). Treatments were either 100 mg/kg Zn and 40 mg/kg Mn in the oxide form with 20 mg/kg Cu in the sulfate form, or 40 mg/kg Zn, 10 mg/kg Cu and 20 mg/kg Mn as MHAC. Transcriptomic analysis of blood mRNA was conducted. A topology-based pathway activation algorithm analyzed signatures of significantly activated pathways related to nutrient metabolism, inflammation, immune regulation, and oxidative balance.

Results

MHAC affected approximately 5 times as many genes in barrows than gilts. Compared to ITM, MHAC gilts showed lower oxidative stress inlcuding DNA repair, apoptosis, oxidative stress induced cell senescence and the keap1-Nrf2 pathways ($P<0.05$). MHAC in gilts appeared to have a greater insulin effect as observed by decreases in glucose pathways ($P<0.05$). MHAC in gilts reduced inflammation ($P<0.05$) and immune sensing (MHC II antigen presentation, T and B cell signalling; $P<0.05$). There was a 1.8 log fold reduction in collagen degradation gene expression for MHAC in gilts (COL1A1 and COL1A2; $P<0.01$). In contrast, for barrows, the primary MHAC was on phospholipid metabolism ($P<0.05$) and immune response i(neutrophil degranulation,$P<0.05$; TLR4-LPS recognition, $P<0.10$).

Discussion and Conclusion

The MHAC mode of action on pig performance and survival may differ between barrows and gilts. Primary modes of action include nutrient metabolism, immune funcstion, oxidative balance and inflammation as well as structural integrity.

VPH-PP-21

BARROW AND GILT WEIGHT SUBCLASSES DIFFER IN PATHWAY ACTIVATION SIGNATURES IN RESPONSE TO METHIONINE HYDROXY ANALOGUE BIS-CHELATES

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Background and Objectives

Different weight classes of barrows and gilts may have differing responses to nutrients. This study objective was to utilize pathway activation signatures determined from differential gene expression in blood from heavy vs. light barrows and gilts to determine the methionine hydroxy analogue bis chelate (MHAC) mode of action in each weight class within gender.

Material and Methods

Blood samples from 1 barrow and 1 gilt per pen were taken from 21 pens per treatment after 52-d (75 kg). Treatments were either 100 mg/kg Zn and 40 mg/kg Mn in the oxide form with 20 mg/kg Cu in the sulfate form (ITM) or 40 mg/kg Zn, 10 mg/kg Cu and 20 mg/kg Mn in the MHAC form. mRNA extracted from blood samples was used for transcriptomic analysis. A topology-based pathway activation algorithm analyzed signatures of significantly activated pathways related to immune regulation, oxidative balance and nutrient metabolism in the MHAC treatment relative to ITM control in heavy (33.8 kg) vs. light (27.4 kg) pens..

Results

Growth rate to 52-d was 88 g/d (10%) greater for heavy vs. light pens. Heavy MHAC gilts had greater oxidative stress mRNA markers compared to ITM with low weight MHAC gilts having lower oxidative stress markers. Heavy and light gilts had similar MHAC reduced expression of immune markers. Low weight MHAC barrows had increased expression of the immune markers TNF, TLR4 LPS recognition and IL-17 ($P<0.01$) compared with ITM while the opposite occurred in high weight MHAC barrows. Greater oxidative balance measures (glutathione metabolism, antioxidant enzymatic systems, and apoptosis) were observed with low bodyweight MHAC barrows vs. ITM ($P<0.05$) but were greater with MHAC than ITM in heavy barrows ($P<0.05$).

Discussion and Conclusion

These results demonstrate different physiological impacts of MHAC in low vs. high body weight/growth rate barrows and gilts.

VVD-PP-01

SUSTAINED CIRCULATION OF A NEW REASSORTANT HUMAN LIKE H3N2 INFLUENZA VIRUS AMONG PIG FARMS IN ITALY

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Background and Objectives

Globally, influenza A virus (IAV) endemic subtypes in pigs include H1N1, H1N2, and H3N2. In Europe, genetic and antigenic variability has increased, especially for H1N1pdm09, due to reassortment and antigenic variant emergence. Circulating subtypes belong to evolving genetic lineages driven by human-pig transmission, fostering host-specific adaptation. H3N2, once more prevalent, now persists in Germany, Spain, the Netherlands, and Italy, with the lineage A/swine/Gent/1/1984 declining but still present. Between 2021 and 2025, new diverse H3N2 viruses were identified in Northern Italy.

Material and Methods

Clinical samples—including oral fluids, nasal swabs, and lung tissues —were obtained from respiratory outbreaks in pig farms in Northern Italy between January 2021 and December 2025. Samples that tested positive for IAV by real-time RT-PCR targeting the M gene, were subtyped with nested RT-PCR and whole genome sequencing was performed. Clade classification of H3-HA sequences was performed on the BV-BRC website, using the Subspecies Classification section.

Results

We recently detected 22 H3N2 recombinant strains, all characterized by a human-origin haemagglutinin (HA) segment, belonging to the 2019-2020 influenza season, suggesting a recent transmission event from humans to pigs. Among this group of strains, 18 viruses were detected in 2025, indicating a recent sustained transmission among swine farms. These strains exhibited complex genetic constellations, mixing human H3 with internal gene segments derived from established pig lineages or pandemic strains (pdm09). Serological analyses suggested that existing commercial pig vaccines, targeted at older strains, may offer little or no significant cross-protection against the human-origin H3 antigen.

Discussion and Conclusion

These findings highlight that acquiring human-like HA could confer an evolutionary advantage to the virus, facilitating its spread and emphasizing the need for ongoing surveillance at the human-animal interface to monitor emerging threats.

VVD-PP-02

USING A PRRS MODIFIED LIVE VIRUS VACCINE AT WEANING CONFERS PARTIAL PROTECTION AFTER CHALLENGE WITH A HIGHLY VIRULENT PRRSV-1 STRAIN DURING THE ENTIRE REARING PERIOD

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Background and Objectives

Porcine reproductive and respiratory syndrome (PRRS) remains a major challenge despite the use of modified live virus (MLV) vaccines, as protection is often incomplete against genetically divergent or highly virulent strains. This study evaluated the efficacy of a commercial MLV vaccine in nursery and fattening pigs following intranasal challenge with the highly virulent PRRSV-1 Rosalia strain.

Material and Methods

Two independent experiments assessed the efficacy of the Porcilis PRRS MLV vaccine against the highly virulent Rosalia strain (Lleida 029_22; $2x10^5$ $TCID_{50}$). Forty-six four-week-old PRRSV-naïve pigs were randomly assigned to vaccinated-and-challenged (V/Ch) or mock-vaccinated-and-challenged (MV/Ch) groups. In Experiment 1, V/Ch (n=10) and MV/Ch pigs (n=10) were vaccinated and mock-vaccinated, respectively, at weaning; both groups were challenged intranasally four weeks later. Experiment 2 followed the same design, with V/Ch (n=13) and MV/Ch (n=13) pigs challenged at 5 months of age. Pigs were monitored for 28 days post-challenge (dpc), with regular clinical assessments and sampling for virological analysis.

Results

In both experiments, V/Ch pigs showed clinical signs (mainly lethargy and dyspnea) that were milder and of shorter duration than MV/Ch pigs. Fever (≥40.5 ºC) appeared around 2-3 dpc, resolving by 9-10 dpc in V/Ch pigs, while MV/Ch pigs remained febrile. In Experiment 1, 60% of MV/Ch pigs died from severe respiratory distress and limb swelling, whereas all V/Ch pigs survived ($p<0.05$). In Experiment 2, only one MV/Ch pig died, presenting typical PRRS clinical signs. In nursery pigs, vaccination reduced macroscopic interstitial pneumonia by 40% and resulted in milder lung lesions, though no improvement was observed in finishers. Overall, V/Ch pigs showed lower viral loads.

Discussion and Conclusion

A single dose of Porcilis PRRS MLV vaccine in weaned piglets provided partial yet lasting protection against the highly virulent PRRSV-1 Rosalia strain, reducing clinical severity, mortality and lung pathology.

VVD-PP-03

COMPARISON OF PCR PROTOCOLS FOR PRRSV-1 AND PRRSV-2 DETECTION IN ORAL FLUIDS FROM FATTENING PIGS

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) remains a major challenge in swine production, requiring reliable diagnostic tools for herd monitoring. This study compared established PCR protocols with the IDEXX RealPCR PRRSV-1/PRRSV-2 Multiplex RNA Test regarding qualitative performance.

Material and Methods

Oral fluids (OFs) were collected longitudinally from 21 herds at four times during fattening. A total of 84 OFs were analyzed by real-time PCR using established protocols (EP) and the IDEXX PRRSV-1/PRRSV-2 real-time PCR (ID). Questionable results were analyzed twice and rated positive either in terms of parallel or serial testing.

Results

In terms of parallel testing, ID revealed 21.4 % (18/84) and EP 15.5 % (13/84) PRRSV-1 RNA positive samples. PRRSV-2 RNA was present in 13.1 % (11/84) of all OFs; in 7.1 % PRRSV-2 RNA was detected by both PCRs, while ID and EP detected 11.9 % and 8.3 % positives, respectively. Regarding serial testing, PRRSV-1 RNA was detected in 17.9 % of all OFs using ID and 13.1 % using EP. PRRSV-2 RNA was identified in 9.5 % and 6.0 % of the samples by ID and EP, respectively. Kohens Kappa, revealed perfect and substantial agreement between both PCRs (PRRSV-1: parallel $|$ =0.803; serial $|$ =0.819; PRRSV-2: parallel $|$ =0.674; serial $|$ =0.751; $p<0.001$).

Discussion and Conclusion

The ID multiplex PCR identified more positive samples and showed substantial to perfect agreement with established protocols for both PRRSV-1 and PRRSV-2, indicating higher analytical sensitivity.

VVD-PP-04

DIFFERENCES IN PRRSV DETECTION CAPACITY ACCORDING TO SAMPLE TYPE AND TIME SINCE EXPOSURE OF GILTS IN GDU.

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Background and Objectives

Effective surveillance of PRRSV plays an important role in understanding transmission patterns and improving disease control strategies on commercial farms. The detection rate of PRRSV varies between different sample types over time[1]. PRRSV can persist in the tonsils for up to 150 days after infection[2]. The aim of this study was to compare the detection rate of PRRSV by RT-PCR in sera, tracheobronchial swabs, and tonsil-oral-scrapings in gilts at different times after PRRSV exposure.

Material and Methods

Samples were collected from 30 gilts in the GDU of the same sow farm. At the start of the study, the animals were at least 20 weeks old. All animals were sampled using three different methods: sera, deep tracheobronchial swabs, and tonsil-oral-scrapings. Samples were collected at 5, 10, 15, and 20 weeks post-PRRSV exposure. All samples were processed individually using the same extraction kit and analysed using the VetMAX PRRSV EU NA 2.0 Kit (Thermofisher). CT values and detection capability were analysed using Minitab®22.0 statistical software.

Results

At 5 weeks post-exposure, all sample types were 100% positive. From 10 weeks after exposure onwards, tonsil-oral-scrapings showed significantly greater detection capacity than sera and deep tracheobronchial swabs. In terms of viral load values (Ct), statistically significant differences were observed between tonsil-oral-scrapings and sera and between tonsil-oral-scrapings and deep tracheobronchial swabs at 10, 15, and 20 weeks after exposure. There were no differences in detection capacity or viral load between sera and deep tracheobronchial scrapings.

Discussion and Conclusion

The results of this study demonstrated that tonsil-oral-scrapings can detect more positive animals, with higher viral loads and for longer after exposure than sera and deep tracheobronchial swabs, confirming that this type of sample is very useful for monitoring replacement animals previously exposed to PRRSv, especially towards the end of the excretion period.

VVD-PP-05

KNOWLEDGE AND PERCEPTIONS OF SWINE FLU AMONG SWINE VETERINARIANS IN THE IBERIAN PENINSULA

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Background and Objectives

Understanding swine veterinarians' level of awareness and knowledge of the public health risks associated with swine influenza (SI) is essential for addressing these risks. This study aimed to assess the level of knowledge among swine veterinarians and identify gaps and misconceptions about the disease.

Material and Methods

A survey was distributed by QR code or email among swine veterinary associations in Spain and Portugal, and during scientific symposia in 2024-2025. The survey included aspects related to the actual knowledge on the etiological agent, transmission, diagnosis, public health and economic impact of the disease.

Results

Eighty-seven responses were received. Most participants identified influenza A virus as the cause of SI, although 5.7% indicated influenza C or were unsure. The three main influenza A subtypes circulating in pigs were identified by 73.5% of the veterinarians. Nearly all (98.9%) reported performing laboratory diagnosis to confirm clinical suspicion, but only 28.7% carried out systematic monitoring. Most veterinarians (90.8%) considered infected animals the principal source of introduction of influenza into the farms, and 48.3% also viewed humans as a potential source. The zoonotic risk of SI was identified by 90.8%, and 43.7% reported being aware of human cases acquired from pigs. The seasonal flu vaccination rate among respondents was 49.2%, yet 45.9% believed that a swine-origin influenza A pandemic was impossible or were uncertain. Most respondents recognized the economic impact of endemic influenza, though few had quantified it with field data. Increased antibiotic use was the main cost, estimating up to 3€ extra per pig in affected nurseries.

Discussion and Conclusion

Overall, the survey reveals a suboptimal level of awareness and understanding of swine flu and its associated risks, although the rate of vaccination among the veterinarians is remarkable. Importantly, influenza was identified as an important cause of antibiotic consumption which is also a concern for public health as well.

VVD-PP-06

PATTERNS OF GENETIC DIVERSITY AMONG SWINE INFLUENZA A VIRUSES IN PIG FARMS IN THE UK (2024–2025)

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Background and Objectives

Swine influenza A virus (swIAV) is a significant respiratory pathogen in pigs that presents zoonotic concerns and contributes to economic losses. Its continual evolution through reassortment and antigenic drift produces extensive genetic and antigenic diversity, complicating control strategies. This study investigated circulating swIAV subtypes and defined hemagglutinin (HA) clades detected in UK pig farms from January 2024 to July 2025.

Material and Methods

Nasal swabs collected at farm level were tested by real-time PCR. Samples with Ct values <30 were subtyped using multiplex real-time PCR, and those with Ct <25 were further analyzed by next-generation sequencing (NGS) to assign HA clades.

Results

A total of 80 submissions were analysed, with successful subtyping achieved for 20 of them. 18 HA sequences were generated. Among all submissions, 40% were classified as H1huN2, 35% as H1avN1, and 25% as H1pdmN1.
For sequenced H1huN2 samples (n=8), 75% grouped within clade 1B.1.1, while the remaining strains corresponded to clades 1C.2.1 and 1B.2 (“other human”). All sequenced H1avN1 viruses fell within clade 1C.2.2. H1pdmN1 viruses were assigned to clade 1A.3.3.2, originating from the 2009 pandemic lineage.
Analysis of internal genes showed that most viruses (17/18), irrespective of subtype, carried pandemic-origin internal segments.

Discussion and Conclusion

Recent European surveillance indicates that swIAV continues to diversify, with frequent emergence of new genotypes driven by reassortment. According to the ESFLU network, up to 18 distinct genotypes are currently circulating across Europe, illustrating both sustained viral evolution and ongoing cross-border movement (ESFLU, 2024). The coexistence of multiple subtypes, together with the observation that circulating H1avN1 and H1huN2 viruses in pig populations frequently carry pandemic-origin internal genes, highlights the need for a more integrated control strategy. This broader protection is essential to reduce clinical signs and reduce the risk of further reassortment events.

VVD-PP-07

PREVALENCE OF PORCINE RESPIRATORY CORONAVIRUS, PORCINE HEMAGGLUTINATING ENCEPHALOMYELITIS VIRUS AND INFLUENZA D VIRUS IN SPANISH HERDS.

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Background and Objectives

Porcine respiratory disease complex causes significant economic losses to the pig industry. Although most investigations have focused on major etiological agents, especially swine influenza A virus (swIAV) and Porcine reproductive and respiratory virus (PRRSV), others such as porcine respiratory coronavirus (PRCV) and porcine hemagglutinating encephalomyelitis virus (PHEV) are rarely investigated. Moreover, other viruses such as influenza D virus (IDV) have been occasionally reported in pigs. The aim of the present study was to assess the prevalence of these three viruses in suckling piglets and growers of farms with or without overt respiratory disease.

Material and Methods

The presence of PRCV, PHEV and IDV was examined by RT-qPCR in nasal swabs collected from pigs in farrowing units (n = 39) and nurseries (n = 50) on Spanish farms. Samples originated either from pigs with respiratory disease or from animals submitted for swIAV or PRRSV monitoring purposes. For each farm, at least 20 nasal swabs were submitted.

Results

Regarding PRCV, 43.6% of the farrowing units had positive animals with an overall prevalence of 28.5% in suckling pigs. In nurseries, 54.0% had positive animals, with an overall prevalence of 28.1% in pigs. No significant differences in prevalence were observed between sick and healthy animals at any age.For PHEV, 73.7% of the farrowing units and 80.0 % of the nurseries had positive animals. The overall prevalence in suckling pigs was 55.0%, and 39.0% of the growers were positive. The prevalence of infection was not significantly different between healthy and sick pigs. IDV was not detected in any sample.

Discussion and Conclusion

The present results indicate that both PRCV and PHEV occur in a considerable proportion of farms and are already circulating from an early age, although they do not seem to be particularly prevalent in sick animals.

VVD-PP-08

EPIDEMIOLOGY OF INFLUENZA A VIRUS IN SWISS PIG HERDS: SUBCLINICAL CIRCULATION AND ASSOCIATED RISK FACTORS

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Background and Objectives

Influenza A viruses (IAVs) are important respiratory pathogens of pigs, impacting animal health and productivity. However, their epidemiology in Swiss pig herds remains poorly understood. Therefore, we conducted a nationwide study to investigate IAV occurrence, associated risk and protective factors, and genetic characteristics.

Material and Methods

125 herds were examined, including 40 with clinical respiratory disease and 85 without obvious signs. Caretakers completed semi-structured interviews on management, biosecurity, and human health. The pig herd was clinically examined, and nasal swabs were taken, with sampling designed to detect infection in least one individual with 95% confidence at assumed within-herd prevalences of ε50% (clinical) and ε15% (subclinical). Samples were analyzed by pan-IAV qPCR, and whole-genome sequencing was performed on positive samples.

Results

Overall, 51 herds (40.8%) and 11.8% of sampled pigs tested positive for IAV. Notably, 60.8% of positive herds showed no clinical signs. Questionnaire analysis revealed non-significant but consistent trends toward higher IAV detection in herds with higher production intensity and/or biosecurity gaps. Viral sequences clustered within the European avian-like H1N1 lineage (1C.2.2), forming a monophyletic group with previous Swiss strains, suggesting continued viral circulation largely isolated from neighboring countries.

Discussion and Conclusion

IAV is a common but often subclinical infection in Swiss pig herds, with epidemiological patterns resembling those reported elsewhere in Europe. Despite smaller herd sizes and a largely closed production system, risk factors such as biosecurity shortcomings and higher production intensity appear to facilitate viral circulation. Strengthened surveillance and biosecurity measures are needed to mitigate the impact of IAV on swine health and to reduce zoonotic risk at the pig–human interface.

VVD-PP-09

EFFICACY OF A COMMERCIAL PRRS MLV VACCINE IN REDUCING THE IMPACT OF A VIRULENT PRRSV-1 ROSALIA CHALLENGE

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Background and Objectives

In 2020, a highly virulent Porcine Reproductive and Respiratory Syndrome Virus type 1 (PRRSV-1) strain emerged in Spain and has became predominant across the northeastern region. The disease caused severe reproductive losses, increased sow mortality, and nursery pig mortality exceeding 20%. This study aimed to assess the efficacy of a modified-live virus (MLV) PRRS vaccine against experimental challenge with one of these highly virulent isolates.

Material and Methods

Fifty four-weeks-old PRRSV-naive pigs were assigned to three groups: T1 (vaccinated and challenged, n=20), T2 (non-vaccinated and challenged, n=20), and T3 (non-challenged controls, n=10). After one week of acclimation, group T1 was vaccinated intramuscularly with Ingelvac PRRSFLEX® EU (Boehringer Ingelheim), while T2 and T3 received PBS. Four weeks later, groups T1 and T2 were intranasally challenged with a highly virulent PRRSV-1 (strain UC_Lleida_N5) ($\varepsilon 10^{4.8}$ $TCID_{50}$/ml, 1 ml per nostril). Animals were monitored for clinical signs, rectal temperature, and growth performance. Blood, nasal swabs, and air samples were collected to assess viremia, viral shedding, and air transmission. The lung weight:body weight ratio was calculated at necropsy as an indicator for lung inflammation.

Results

All challenged pigs became infected. Non-vaccinated animals had, on average, more prolonged rectal temperatures (>40ºC) (25 days vs 14.15 days). At 14 days post-challenge, vaccinated pigs had significantly less lung inflammation (LW/BW= 1.31±0.24% vs 1.69±0.49%, T-test; $p<0.05$) and a five-fold lower viremia Area Under the Curve from the first 35 days after infection (6.39±0.41 vs 7.14±0.37 log RNA copies/ml,T-test; $p<0.05$). Vaccination also reduced nasal shedding and improved average daily weight gain (505.7±126.9 g vs 334.6±140.6 g,T-test; $p<0.05$).

Discussion and Conclusion

Intramuscular administration of the MLV PRRS vaccine provided significant clinical, pathological, virological, and productive protection against the challenge with the highly virulent PRRSV-1 Rosalia strain.

VVD-PP-10

EVALUATION OF PRRS ANTIBODY TEST FOR ORAL FLUID IN HERDS FEEDING SPRAY-DRIED PLASMA

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome (PRRS) surveillance in Denmark relies on serological testing of serum samples, but there is a growing demand for less invasive and more cost-effective samples, such as oral fluid (OF). Reports in the literature suggest that use of spray-dried plasma (SDP) of pig origin in weaner feed may cause false-positive results when testing PRRS antibodies (Ab) in OF. In Denmark, SDP is used in the starter feed for weaners for one to two weeks after weaning, but not for older weaners and hence. OF PRRS Ab Test might be useful for the oldest pigs in the weaning section (30 kg). This study evaluated the use of PRRS OF Ab Test for 30 kg weaners in herds using SDP in starter feed.

Material and Methods

The study was conducted in 10 randomly selected weaner herds negative for PRRS antibodies and using SDP in starter feed. OF, serum and feed samples were collected from weaners at 30 kg. Serum samples were analyzed with IDEXX PRRS X3 Ab Test, and OF and feed samples were analyzed with IDEXX PRRS OF Ab Test. Positive reactions were defined as S/P ratio ε 0.4 for serum and ε1.0 for OF and feed.

Results

In 6 out of 10 herds, PRRS antibodies were detected in feed and OF samples from 30 kg weaners, despite negative serum results. A positive correlation between PRRS S/P ratios in feed and OF was observed, supporting the hypothesis that antibodies detected in OF originated from SDP in the feed.

Discussion and Conclusion

The findings show that PRRS OF Ab Test for OF is unsuitable for weaner herds using SDP in feed, as it may yield false positive results, probably due to cross-contamination of the feed for the older pigs. The study highlights the importance of considering feed composition when implementing alternative surveillance methods.

VVD-PP-11

ROTAVIRUSES IN SUCKLING PIGLETS: NEW INSIGHTS INTO THE PREVALENCE AND SIGNIFICANCE OF TYPES A, B, AND C IN CASES OF DIARRHEA

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Background and Objectives

Rotavirus is a frequently identified etiological agent in cases of diarrhea, particularly among neonates. In swine, five distinct Rotavirus groups (A, B, C, E, H) have now been characterized, with Rotavirus A and C historically receiving the most research attention. More recently, Rotavirus B has also been recognized as a potential contributor to gastrointestinal disease in suckling piglets. To gain a comprehensive understanding of the prevalence and distribution of Rotavirus groups A, B and C among piglets exhibiting diarrhea, fecal samples were systematically analyzed.

Material and Methods

A total of 480 fecal samples from suckling piglets presenting with diarrhea were submitted to the laboratory over a six-month period and subjected to real-time PCR (Kylt® porcine/bovine Rotavirus type A / LSI VetMAX™ Rotavirus A/B/C kit) analysis for the detection of Rotavirus types A, B, and C. Cycle threshold (Ct) values were recorded for each sample. The samples originated from eight different countries, with the majority (82.7%) collected in Germany.

Results

Of the samples tested, 32.3% were negative for all three Rotavirus types. Rotavirus A was detected in 42.3% of samples, Rotavirus B in 24.3%, and Rotavirus C in 32.5%. Coinfection with all three Rotavirus types was observed in 8.13% of cases. A comparison with other European literature will be made in the contribution.
Further results will be presented in the contribution.

Discussion and Conclusion

To our knowledge, this study represents the most extensive evaluation to date of the prevalence of Rotavirus A, B, and C in suckling piglets. The majority of samples contained genetic material from at least one Rotavirus group, with Rotavirus A remaining the most prevalent. Further research is warranted to clarify the role of these viruses, particularly Rotavirus B, in the pathogenesis of diarrhea in piglets, as current literature remains limited.

VVD-PP-12

MOLECULAR IDENTIFICATION AND PHYLOGENETIC ANALYSIS OF SWINE ORTHOPNEUMOVIRUS (SOV) AND RESPIROVIRUS SUIS (PRV1) IN NORTHERN ITALY

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Background and Objectives

Swine orthopneumovirus (SOV) and respirovirus suis (PRV1) are emerging respiratory viruses within the Pneumoviridae and Paramyxoviridae families, respectively, whose epidemiology and pathogenic significance in pigs remain poorly defined. Given the economic impact of respiratory diseases in swine production and the role of pigs as reservoirs for multiple viral pathogens, improving our understanding of the circulation and genetic characteristics of both SOV and PRV1 is of increasing relevance. This study investigated the occurrence and genetic diversity of these two viruses in pig herds from Northern Italy, with a particular focus on their molecular characterization and potential involvement in respiratory disease.

Material and Methods

A total of 644 diagnostic samples—including lungs, oral fluids, nasal swabs, and bronchoalveolar lavages—were collected from pigs exhibiting respiratory signs between January 2024 and April 2025 in Lombardy, Emilia-Romagna, and Veneto. Samples underwent virologic screening, and the presence of SOV and PRV1 RNA was assessed using real-time RT-PCR. Whole-genome sequencing was also performed.

Results

SOV was detected in 15 samples and PRV1 in 22 samples, with both viruses predominantly originating from Lombardy. Partial sequences from four SOV-positive samples clustered with previously reported strains from Asia, the USA, and Europe, suggesting potential international circulation. Likewise, PRV1 whole-genome sequences grouped with strains previously detected in Europe and Asia, falling within European lineage 1.

Discussion and Conclusion

Coinfections were common: SOV was frequently detected alongside major swine respiratory pathogens, particularly PRRSV and swine influenza virus, and coinfection with PRV1 was observed in five cases. Full-length genomes of four PRV1 strains and partial genomes of five SOV strains were obtained, including from coinfected samples, providing novel insights into the molecular diversity of both viruses. Overall, these findings provide complementary epidemiological and molecular data on SOV and PRV1 in European pig populations, highlighting their co-circulation and supporting their inclusion in diagnostic and surveillance programs for porcine respiratory disease.

VVD-PP-13

MULTILAYERED INTESTINAL RESPONSE TO SWINE ENTERIC CORONAVIRUS INFECTION: CLINICAL, MORPHOLOGICAL, AND MICRORNA-TARGET GENE DYNAMICS DURING PRIMARY INFECTION AND RE-CHALLENGE IN PIGLETS

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Background and Objectives

Swine enteric coronaviruses are major enteric pathogens, but the coordinated intestinal host response, including spanning transcriptional regulation, microRNA activity, and intestinal structural remodeling changes, remains largely unexplored. This study aimed to characterize the response to PEDV, SeCoV, and rPEDV-SeCoV infection by integrating clinical data, growth, histomorphometry, viral load, and immune-related gene and microRNA expression.

Material and Methods

Forty-eight three-week-old piglets were allocated into four groups: control (A), PEDV (B), SeCoV (C), and rPEDV–SeCoV (D). Primary oral infection was followed by homologous (D) or heterologous (B, C) re-challenge at 20 dpi. Clinical signs, growth performance (ADG), histomorphometric parameters and viral load in duodenum and jejunum were assessed at 3 and 6 dpi (primoinfection), and at 23 and 26 dpi (after re-challenge). Expression of TJP1, IL8, IL10, TNF, TGFB1, FOXP3, IFNG, and the miRNAs miR-21, miR-124, miR-15b, miR-19a, miR-17, miR-146a, miR-155, miR-223, miR-375 and miR-27b were analyzed by RT-qPCR and statistically processed.

Results

Challenged groups exhibited transient diarrhea, reduced ADG, and lower villus and mucosal height, partially recovering by 26 dpi. Viral RNA peaked at 3 dpi and persisted longer in heterologous re-challenge groups. Anti-inflammatory miRNAs were upregulated after re-challenge, showing moderate positive correlations with cytokines: miR-146 and miR-223 with IL8 in duodenum ($r=0.5$; $p=0.0003$), and miR-27b with IFNG in jejunum ($r=0.5$; $p=0.0002$). Pro-inflammatory miRNAs also increased, with miR-15b correlating with IFNG (duodenum: $r=0.53$, $p=0.0001$; jejunum: $r=0.53$, $p<0.0001$), and miR-155 correlating with IFNG in jejunum ($r=0.53$; $p=0.0001$).

Discussion and Conclusion

Swine enteric coronavirus infection induced clinical disease, reduced growth, and intestinal damage with distinct viral kinetics between homologous and heterologous re-challenges. Specific miRNAs (miR-146, miR-223, miR-27b, miR-15b, and miR-155) correlated with cytokines, suggesting roles in inflammatory regulation. These findings highlight the need for mechanistic studies on miRNA-mediated mucosal immunity to clarify their potential as biomarkers and therapeutic targets.

VVD-PP-15

INACTIVATION OF AVIAN INFLUENZA VIRUS INOCULATED IN SPRAY-DRIED BOVINE PLASMA

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Background and Objectives

Avian influenza virus (AIV) poses an important biosecurity risk for livestock because it infects birds and may evolve to threaten other species. Spray-dried plasma has shown broad viral safety but due to limited data on avian influenza survival in spray-dried materials, this study investigated the persistence of low-pathogenicity AIV H1N1 inoculated onto spray-dried bovine plasma (SDBP) and stored at room temperature for up to 21 days.

Material and Methods

A low-pathogenicity H1N1 strain was propagated in embryonated chicken eggs (ECE) to produce a high-titer stock. Sixty grams of gamma-irradiated SDBP were inoculated with 9 mL of virus via gradual spraying and manual agitation to achieve homogenization. One-gram portions of inoculated SDBP were placed into nine glass tubes (0.5 cm inner diameter) and stored at 22°C. Three tubes were collected at 0, 7, 14 and 21 days and frozen at −75°C before titration. A 10 g subsample was kept at −75°C as a negative control. Viral infectivity was assessed in ECE using undiluted material and 10-fold dilutions. Five eggs per dilution were inoculated with 100 µL of sample and monitored for 7 days. Viral reduction (LogR) was calculated by comparing initial inoculum titres with titres detected after storage.

Results

The initial inoculum contained $10^{7.7}$ TCID50/mL. Inoculated SDBP at day 0 showed a mean titre of $10^{3.95\pm0.25}$ TCID50/mL. All samples stored at any time-tested negative for H1N1, with no evidence of infectivity. The detection limit was $10^{1.5}$ TCID50/mL. Overall viral reduction was $\varepsilon 10^{2.42}$ TCID50/mL, indicating complete loss of detectable virus during storage.

Discussion and Conclusion

AIV H1N1 inoculated onto SDBP showed rapid loss of infectivity and remained undetectable after one week at room temperature. These finding indicate ε2.42 log10 TCID50/mL reduction and supports the safety of SDBP as a feed ingredient.

VVD-PP-16

OPTIMIZING SAMPLING PROTOCOLS FOR AUJESZKY'S DISEASE DIAGNOSTICS; IN VITRO EXPERIENCES

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Background and Objectives

Aujeszky's disease (AD) is a notifiable disease in the European Union (EU). The causative virus (ADV) is present in wild boar populations in several EU countries, whereas others are free of ADV. Recent AD outbreaks in domestic pigs in the EU, notably in outdoor farms, make it essential to optimize tools for sampling suspect cases and the conditions for transport and storage of samples for laboratory diagnosis. Therefore, an in vitro study was conducted by four collaborating partners (one WOAH reference laboratory and 3 national reference laboratories) to asses swab types, transport media and storage conditions.

Material and Methods

The experiments were conducted using a local ADV isolate and two reference strains (Bartha and NIA3). Each strain was applied to cotton and flocked swabs, both with and without transport media. The swabs were then stored at three differerent temperatures (4 °C, room temperature, and 37 °C) for 0, 24, 48, 72, and 96 hours. Sample preparation, DNA extraction and qPCR testing were carried out according to the standard protocols of each laboratory.

Results

PCR results from 2 partners are currently available (full results will be presented during the symposium). All samples (n=546) tested ADV gB positive. In general, the Ct-values of all variables were comparable. In total, only 5 samples showed an increase of >3 Ct-values compared to the Ct-value of the respective swab and medium type at timepoint 0.

Discussion and Conclusion

These preliminary results demonstrate that swab types and storage media do not influence the sensitivity of ADV detection by gB qPCR, when samples are stored up to 96 hours at 4°C, room temperature, and 37 °C. Further work is ongoing to determine how these conditions might influence virus viability and to validate these data using clinical samples from experimentally infected animals.

VVD-PP-17

GENETIC DIVERSITY OF PCV2 IN SWINE FARMS OF JALISCO, MEXICO

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Background and Objectives

PCV2 is responsible for Porcine Circovirus Diseases, has a substantial impact on swine productivity. Effective control depends on early diagnosis, consistent vaccination, and strong biosecurity measures, all of which influence the genetic diversity of the virus. The ORF2 gene, which encodes the capsid protein, is highly variable and has contributed to genotype shifts observed globally. This study aimed to PCV2 detection and to describe the genetic variability of circulating strains in swine farms in Jalisco, Mexico.

Material and Methods

From 2022 to 2023, 80 farms participating in the "Sanidad Jalisco" program were assessed across four regions classified by swine population density (A-9.46, B3-135.4, B1-210.36 and B2-261.65 pigs/km^2). A total of 4,207 serum samples were pooled into 844 groups and tested by qPCR targeting ORF2. Pools with Ct<30 were selected for full ORF2 amplification (765 bp) followed by Sanger sequencing. Genetic analyses were conducted using MEGA v12.

Results

A total of 70 sequences were obtained and submitted to GenBank under accession numbers PV235521 to PV235590. PCV2 molecular detection was higher in high-density regions, with region B2 showing the highest positivity at 39.9%. ORF2 sequencing revealed a predominance of genotype D (73%), followed by genotype A (27%). Additionally, several sequences clustered closely with strains previously associated with increased pathogenicity.

Discussion and Conclusion

Based on the observations made throughout the study, PCV2 occurrence in high-density regions appears to be largely driven by insufficient vaccination coverage and weak biosecurity practices. The dominance of genotype D, along with the detection of variants potentially linked to increased pathogenicity, underscores the need for continuous molecular monitoring and the adoption of region-specific control strategies. This genetic variability is consistent with national reports and reinforces the importance of integrating epidemiological and molecular data to enhance surveillance efforts. Acknowledgments: SADER-CONACYT -2017-6-292826. SIGI 1281834685.

VVD-PP-18

SWINE INFLUENZA A SUBTYPING RESULTS IN 11 EUROPEAN COUNTRIES FROM JANUARY 2020 TO SEPTEMBER 2025

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Background and Objectives

Swine influenza A virus (swIAV) affects pigs throughout all stages of production. Circulating influenza viruses within pig populations undergo continuous genetic and antigenic evolution, and the distribution of subtypes can vary significantly among regions. The objective of this study is to summarise passive swIAV surveillance data from 11 European countries collected over the past five years.

Material and Methods

This report compiles influenza A virus subtyping data from 2020 to 2024 and from the first three quarters of 2025, based on farm submissions in the UK, DE, ES, PT, BE, NL, IT, FR, PL, HU, and DK. Samples, including nasal swabs, oral fluids, bronchoalveolar lavage fluid, and lung tissue, were collected during outbreaks of acute influenza-like disease or in cases of persistent, unexplained respiratory or reproductive signs. All samples were screened for influenza A virus using real-time PCR, and those with a Ct-value δ30 underwent further subtype determination using multiplex real-time PCR.

Results

Subtype identification was successful for 4,112 swIAV samples. H1avN2 was the most prevalent subtype (29.6%), followed by H1avN1 (27.2%). The proportion of farms positive for H1pdmN1 rose from 10.9% in 2020 to 16.2% in 2025. H1huN2 and H1pdmN2 accounted for 11.7% and 9.4% of detections, respectively, whereas H1huN1 (3.0%), H3huN2 (2.8%), and H3huN1 (0.6%) were detected least frequently.Marked regional variation was observed: in Denmark, no H1hu subtypes were detected, with H1pdmN1 and H1avN2 predominating; in contrast, H1huN2 and H1pdmN1 were the most identified subtypes in the UK. In 2025, H3N2 detections were restricted to Spain, Portugal, and Poland.

Discussion and Conclusion

SwIAV subtype frequencies across Europe showed minor variation between 2020 and 2025, with substantial variation in subtype prevalence among countries. Understanding which strains circulate on farms, and at which stages of production, is essential for implementing appropriate vaccination strategies.

VVD-PP-19

GENETIC DIVERSITY AND CLADE DISTRIBUTION OF SWINE INFLUENZA A VIRUSES IN COMMERCIAL PIG FARMS IN BELGIUM, THE NETHERLANDS, AND GERMANY (2024–2025)

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Background and Objectives

Swine influenza A virus (swIAV) is a respiratory pathogen in pigs, causing economic losses and posing zoonotic risks. Continuous evolution through reassortment and antigenic drift leads to diverse genotypes and clades, challenging control measures. This study aimed to identify circulating subtypes and characterize hemagglutinin (HA) clades of swIAV in swine farms in Belgium, the Netherlands, and Germany between January 2024 and September 2025.

Material and Methods

Clinical samples (nasal swabs, oral fluids, bronchoalveolar lavage, and lung tissue) were tested by real-time PCR. Positive samples with Ct <30 were subtyped using multiplex real-time PCR; those with Ct <25 underwent next-generation sequencing (NGS) for HA-based clade assignment and genotyping.

Results

From 422 farms, subtyping was successful, and 144 HA sequences were generated. Eighteen distinct genotypes were detected. The majority (62%) belonged to Eurasian avian-like H1 lineages: H1avN1 (45%) and H1avN2 (17%). Among sequenced H1av strains (n=105), 82% clustered in clade 1C.2.2, circulating in Europe since the early 2000s; 10% in 1C.2.4, which emerged in France in 2020[2] and 6% in 1C.2.1, historically predominant in Europe since the late 1990s. One isolate belonged to 1C.2., other subtypes included H1hu (24%), with sequenced strains (n=18) in clade 1B.1.2.1, and H1pdm09 (13%), all in clade 1A.3.3.2, which emerged during the 2009 pandemic.

Discussion and Conclusion

A high diversity of swIAV subtypes and genotypes circulates in these regions, dominated by H1av clades already established in Europe and newer variants such as 1C.2.4. Recent European surveillance confirms continued emergence of novel genotypes through reassortment[3,4]. The ESFLU network reports up to 18 genotypes across Europe, reflecting ongoing diversification and cross-border spread (ESFLU, 2024) The persistence of H1hu and H1pdm09 highlights the need of vaccination strategies in sow herds that cover against all prevalent clades to reduce clinical impact and limit viral evolution.

VVD-PP-20

COMPARATIVE PATHOLOGY OF SWINE INFLUENZA A VIRUS LINEAGES IN EXPERIMENTALLY INFECTED PIGS

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Background and Objectives

Swine influenza A virus (IAV) infection produced lineage-dependent variation in respiratory pathology, yet comparative pathological data remain limited. This study aimed to characterize and compare gross and histopathological lesions induced by multiple swine IAV lineages in experimentally infected pigs. Experimental infections were conducted at a collaborating institute, and all pathological evaluations were subsequently performed in our pathology laboratory.

Material and Methods

Pigs were experimentally inoculated with seven IAV strains representing pH1pN1, pH1N2, H1pN1, H1N2, H1N2, H1pN1, and H3N2 lineages. At predetermined time points, animalswere euthanized and respiratory tissues were submitted to our laboratory for pathological analysis. Standardized lesion-scoring systems were applied to lungs and trachea, and histopathological features – including epithelial necrosis, inflammatory cell infiltration, bronchiolar damage, and alveolar involvement – were systemically evaluated.

Results

All infected groups exhibited greater lung and tracheal lesion severity than negative controls. The H1N2 lineage (notably strains 1027-1 and 1039) produced the most severe gross pneumonia and marked epithelial necrosis, accompanied by prominent peribronchiolar inflammation. H1pN1 strains produced moderate, locally extensive bronchiolar lesions, while pH1N1 and H3N2 strains induced comparatively milder pathology. Contact pigs from high-pathotype groups displayed compatible but delayed lesion patterns, consistent with efficient transmission observed by the collaborating virology group.

Discussion and Conclusion

Distinct pathological phenotypes were associated with different swine IAV lineages, with H1N2 strains showing the strongest pathogenic signatures in the respiratory tract. Pathology-centered comparative evaluation provides essential insight into strain-specific disease expression and supports integrated risk assessment for swine influenza.

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VVD-PP-21

THE DANISH PRRS REDUCTION STRATEGY IS WORKING

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Background and Objectives

In May 2022, Danish veterinary authorities, slaughterhouses, veterinarians, and pig producers launched a joint strategy to reduce PRRS in pig production. The aim is for 75% of finishers and 85% of sow herds to be PRRSV seronegative at slaughter. This paper reviews the progress of that strategy.

Material and Methods

Several measures have been introduced to support national efforts to reduce PRRS. One primary measure is the mandatory public reporting of serological PRRSV status for all herds, along with tracking trade patterns and area maps that show the geographical distribution of pig herds by PRRS status in real time. This information is available to pig producers, veterinarians and pig advisors. Additionally, regional eradication programs led by local veterinarians have been implemented to address the virus in areas with high concentrations of PRRS-positive herds.

Results

As of November 2025, regional eradication programs have been implemented across Denmark for all Danish pig herds. PRRS prevalence varies by region, with a higher percentage of PRRSV seropositive herds in the western part of Denmark as compared to the eastern part, which has nearly eliminated PRRS positive herds. The proportion of PRRSV seronegative finishers sent for slaughter increased from 25% to 72% following the introduction of the reduction strategy. Similarly, the proportion of PRRSV seronegative sow herds rose from 58% to 76%.

Discussion and Conclusion

The Danish PRRS reduction strategy, initiated in May 2022, has shown positive outcomes, indicating that the control and eradication models are effective. The next phase of the strategy aims to prevent re-introduction of the virus into PRRS-free areas by implementing regulations on the movement of PRRS-positive pigs and enhancing overall serological surveillance.

VVD-PP-22

PRELIMINARY STUDY OF THE OCCURRENCE OF ANTIBODIES AGAINST PEDV IN THE PIG POPULATION IN POLAND

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Background and Objectives

Porcine epidemic diarrhoea virus (PEDV) is a cause of gastrointestinal disease in pigs. Outbreaks were observed in several European countries. In Poland, PEDV has been detected only sporadically in wild boars and pigs. The primary objective was to preliminarily assess the prevalence of PEDV antibodies in the Polish pig population.

Material and Methods

The study included 11 pig herds located across six Polish provinces. During 2023–2024, blood samples were collected from sows, piglets, weaners, and fatteners. All samples were tested for the presence of antibodies against PEDV using the ELISA ID Screen® PEDV Indirect kit (IDvet) according to the manufacturer's instructions. Statistical analysis included the calculation of 95% confidence intervals (CI) for proportions using the Wilson method and chi-square tests with the Bonferroni correction for multiple comparisons.

Results

819 blood samples were examined (221 piglets, 220 weaners, 160 fatteners, 218 sows). Antibodies against PEDV were detected in 72.7% (95% CI: 43.4%-90.3%) of the herds in all investigated provinces. At the animal level, seroprevalence was 1.25% (95% CI: 0.2%-6.7%). Within-herd prevalence ranged from 1.25% to 8.47%. The percentage of seropositive pigs was 5.1% among sows, 1.4% among weaners, and 1.9% among fatteners. All piglets were seronegative. A difference was observed between the proportion of seropositive sows and piglets ($p = 0.0004$). Herd size or management factors, such as all-in/all-out, did not show statistically significant associations with PEDV seropositivity.

Discussion and Conclusion

The study revealed that antibodies against PEDV (present in at least one seropositive animal) can be detected in a significant proportion of the examined herds. However, in the majority of these herds, only a few positive samples were detected. The highest prevalence of seropositive pigs was observed among sows, whereas the lowest prevalence was recorded in piglets. Understanding the actual prevalence of PEDV in Polish pig herds requires further, more detailed studies.

VVD-PP-23

INFECTION DYNAMICS OF ROTAVIRUS A AND C IN SUCKLING PIGLETS

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Background and Objectives

The neonatal period (birth to weaning) is a critical window for piglet survival and growth. Immature immunity makes piglets highly susceptible to enteric pathogens, among which rotaviruses (RV) remain major causes of neonatal diarrhea. Characterizing Rotavirus A (RVA) and Rotavirus C (RVC) infection through shedding patterns under field conditions helps clarify infection dynamics and supports prevention and control.

Material and Methods

The study was conducted on a farm endemically infected with both viruses. Fifty-two litters in two rooms from non-vaccinated sows were included. Piglets were individually identified at farrowing and monitored daily for diarrhea. From the first ten litters showing clinical signs in each room, fecal samples from five piglets per litter were collected and followed longitudinally for the first three weeks of life. RVA and RVC were detected and quantified by commercial RT-qPCR. Ct values were compared using Dunn's test; proportions positive were evaluated with Fisher's exact test (significance $p<0.05$).

Results

RVC was detected in 40–50% of diarrheic piglets during the first ten days after diarrhea onset and disappeared after day 14. Correspondingly, Ct values increased over time, indicating an early and transient infection pattern characterized by high viral loads at onset and gradual clearance thereafter. RVA had lower initial positivity (~20%), peaked at day 14 (>70%) and persisted variably (20–50%) thereafter. RVA Ct values remained relatively stable (30–40), indicating moderate yet sustained replication and longer circulation than RVC.

Discussion and Conclusion

Under the conditions of this study, RVA and RVC displayed clearly different replication dynamics in suckling piglets. This temporal divergence suggests that both viruses occupy distinct epidemiological niches in neonatal diarrhea. The early predominance of RVC may be associated with lower maternal immunity or competitive interference between co-infecting viruses, potentially mediated by innate antiviral responses limiting subsequent viral replication.

VVD-PP-24

EXTERNAL BIOSECURITY AND OTHER FACTORS ASSOCIATED WITH THE SPREAD OF PRRS VIRUS TO SOW HERDS

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Background and Objectives

Preventing the spread of Porcine Reproductive and Respiratory Syndrome (PRRS) virus to Danish sow herds is crucial for containment and reduction of PRRS in the population. In Denmark, direct transmission to sow herds via purchase of infected pigs is rare due to strict biosecurity and testing, but indirect transmission—such as airborne spread and contamination via people, vehicles, and equipment—are suspected to play a major role. This study aimed to identify the most significant factors associated with indirect transmission routes for PRRS infection in Danish sow herds with generally high external biosecurity.

Material and Methods

Four of a total of 38 newly infected sow herds had purchased pigs from infected farms and were therefore excluded. A case-control study (July 2023–September 2024) was conducted, including 25 recently infected and 50 PRRS-free sow herds, matched by size and region. Data collection involved structured telephone interviews and registry data, focusing on biosecurity procedures, herd management, and local infection risk. Statistical analysis was performed using conditional logistic regression, adjusting for local infection risk via a weighted index.

Results

Generally high standards of external biosecurity was confirmed. Significant risk factors for introduction of PRRS-virus included biosecurity procedures related to weaner transport and staff composition (higher proportion of temporary or trainee staff). A weighted index based on occurrence of PRRS in herds within a 5 km zone, was strongly associated with PRRS transmission, stressing the importance of local transmission, including airborne spread.

Discussion and Conclusion

Only 11% of the newly infected sow herds were infected by purchase of infected pigs, highlighting the importance of indirect transmission. Biosecurity around transport of weaners weighted more than other age groups, possibly due to a higher virus excretion from young pigs. Overall, while biosecurity standards are generally high in the sow herds, and further improvements should focus on transport hygiene and staff training.

VVD-PP-25

GENOTYPIC DIVERSITY OF PORCINE ROTAVIRUS A IN SPANISH PIG FARMS

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Background and Objectives

Porcine Rotavirus A (RVA) causes neonatal diarrhea, mortality and reduced weight gain, producing major economic losses in pig industry. RVA shows high antigenic and genetic variability, requiring ongoing genotypic monitoring for accurate epidemiological surveillance. This study aimed to identify and characterize predominant RVA genotypes in Spanish pig farms through VP7 and VP4 gene sequencing and phylogenetic analyses to evaluate genomic diversity.

Material and Methods

Fecal samples from 116 Spanish pig farms (from prior study including diarrheic feces from piglets during lactation) were screened by RT-qPCR regarding RVA. Samples with Ct<30 were selected for partial sequencing of the VP7 and VP4 genes using previously published primers and additional primers designed in this study. RVA genotypes were assigned using BLAST following Rotavirus Classification Working Group (RCWG) guidelines. Phylogenetic analyses were performed in MEGA using Maximum Likelihood method.

Results

In total, 55 fragments from VP7 and 54 from VP4 coding region were genotyped. Among G genotypes, G9 was the most prevalent (42.0%), followed by G4 (25.8%), while G3 and G5 were less frequent (16.1% each). Regarding P genotypes, P[7] was the most common (34.3%), followed by P[13] (25.3%), P[23] (22.4%), P[6] (14.9%), P[19] and P[32] (1.5% each). The most prevalent G–P genotype combinations in Spain were G9P[7], G9P[23], G4P[7], G4P[6], and G3P[7]. Regional patterns showed predominance of G9P[23] and G9P[7] in some areas, but no single combination was exclusive to any region due to considerable local variability.

Discussion and Conclusion

The results of this study align with previous findings indicate a progressive reduction in RVA genotype diversity compared with earlier years, reflecting displacement of older genotypes by G9-associated strains- likely due to their higher fitness, virulence, and zoonotic potential. Continuous molecular surveillance is essential to monitor viral evolution and detect emerging or zoonotically relevant variants.

VVD-PP-26

OPTIMIZING PRRSV SURVEILLANCE: PERFORMANCE OF VIRAL CONCENTRATION TECHNIQUES APPLIED TO AIR SAMPLES FROM UNSTABLE WEANER UNITS

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Background and Objectives

Air sampling for PRRS Virus is a promising tool to detect and characterize infected farms. This study aimed to evaluate PRRSV detection in air samples processed with different concentration methods.

Material and Methods

Air samples were collected from weaner rooms on seven farms classified as unstable according to the American Association of Swine Veterinarians PRRSV herd classification. Two air samplers were used: MD8 Airport (filtration; 4 and 6 m^3) and Coriolis®µ (cyclonic; 4, 6, 18, and 24 m^3). Blood samples were collected from pigs concurrently to confirm PRRS circulation. Viral RNA was extracted using three parallel procedures: standard extraction (Nucleospin® RNA virus kit) and two concentration methods: ultracentrifugation (Amicon® Ultra-0.5; UC) and polyethylene glycol (PEG) precipitation. Magnetic beads were tested in eight samples. PRRSV RNA was quantified by qRT-PCR (VetMAX). Data were analysed for each sampler using logistic and linear mixed models with method and flow rate as fixed factors and sample as a random factor.

Results

Forty-one samples were evaluated. Filtration outperformed cyclonic when no concentration was applied: positivity was higher (100% vs 50%) and Ct values lower (32.3 vs 34.4). Overall, Cts were high (no positives < 29; SD = 3.0). Neither UC nor PEG significantly improved detection or reduced Ct. ⊗Ct relative to no concentration ranged from -0.8 to +3.1; PEG-treated cyclonic samples even showed significantly higher Cts (+0.9 cycles, $p = 0.023$). Adding magnetic beads lowered Ct in non-concentrated extractions (⊗Ct = -1.2, $p = 0.030$) but provided no significant benefit when combined with UC or PEG.

Discussion and Conclusion

PRRSV detection from air samples yielded high Ct values, indicating low viral recovery even in unstable farms with concurrent PRRS circulation. Concentration methods (UC or PEG) did not improve detection, and magnetic beads were only beneficial in non-concentrated RNA extractions.

VVD-PP-27

IMPACT OF CPD-PRRSV2-MLV AND CONVENTIONAL PRRSV2-MLV VACCINE ON PERFORMANCE AND PROFITABILITY IN COMMERCIAL PIG PRODUCTION

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) remains a major economic threat to the global swine industry, causing respiratory distress in fattening pigs, reduced growth, and production losses. A key control strategy involves modified live virus (MLV) vaccines. A next-generation CPD (codon pair deoptimized)-PRRSV2 MLV, developed using synthetic attenuated virus engineering technology, is designed to improve genetic stability, safety, and cross-protection against PRRSV2. This study aimed to evaluate the field efficacy of a CPD-PRRSV MLV compared with a conventional PRRSV MLV vaccine in reducing losses and improving productivity under commercial conditions.

Material and Methods

A total of 4,112 piglets (2 weeks old) from a 2,000-sow stable PRRS-positive herd routinely vaccinated by conventional PRRSV2-MLV vaccine were enrolled. Piglets were divided into two groups: the CPD-MLV group (n=2,136) vaccinated with the CPD-PRRSV2-MLV lineage 5 (Persoporc®, Ceva), and the Con-MLV group (n=1,976) vaccinated with a conventional PRRSV2-MLV lineage 1. Performance parameters including total loss rate and average daily gain (ADG) were monitored during the nursery and fattening phases. Economic return was calculated using the Gompertz standardization model and current local prices.

Results

In the nursery phase, mortality was 1.12% vs. 1.32%, and ADG was 308.9 vs. 279.7 g/day for the CPD-MLV and Con-MLV groups, respectively. During the fattening phase, mortality was 3.00% vs. 3.08%, and ADG was 895.5 vs. 862.2 g/day. Net profit per pig was 48.27 € for the CPD-MLV group versus 42.88 € for the Con-MLV group, resulting in a ⊗profit/pig of 5.39€ in favour of the CPD-MLV group.

Discussion and Conclusion

The next-generation CPD-PRRSV MLV showed superior outcomes in growth, survival, and profitability, indicating improved protection. These findings suggest that Persoporc® (Ceva) offers a more effective and sustainable approach for PRRS control, improving herd health and productivity in commercial swine systems.

VVD-PP-28

PREVALENCE STUDY OF TYPE A ROTAVIRUS (RVA) IN FRENCH PIG FARMS

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Background and Objectives

Type A Rotavirus (RVA) is a resistant and virulent pathogen causing neonatal piglet diarrhea (NPD). While its impact is known, data is often limited to clinically ill animals with less information on asymptomatic carriers or sow prevalence. This study evaluated RVA prevalence at three stages (sows, suckling piglets, weaners) on farms categorized into three groups based on the severity of NPD clinical signs.

Material and Methods

Seventeen non-RVA vaccinated farms were enrolled and grouped by clinical NPD status in sucking piglets : Group 1 (none), Group 2 (mild), Group 3 (severe). In each farm, samples were collected from 5 sows, 15 of their piglets (3/litter pooled together, 1-7 days old), recently weaned piglets from the last batch (5 swiffers, 1/pen) and analyzed using RVA RT-PCR. Risk factors, such as hygiene, drinking methods, farrowing management and prophylaxis measures were also documented.

Results

RVA detection varied significantly by age and clinical group. Sampled sows were almost entirely negative. In suckling piglets, RVA was only detected in Group 3 (40% of tested pools positive). Groups 1 and 2 were 100% negative. Conversely, RVA was highly prevalent in weaners across all groups (16/17 farms positive) with high positivity rates (71-78%) even on farms with no neonatal diarrhea. Most of these weaners were asymptomatic.

Discussion and Conclusion

The study confirms a strong association between RVA detection and the severity of clinical diarrhea in suckling piglets in which sows surprisingly appear to play a minimal transmission role. On the contrary, the high prevalence of RVA in asymptomatic weaners identifies them as a major viral reservoir, independent of the farm's neonatal clinical status. These observations associated with the intrinsic nature of the RVA (virulent and resistant) highlight the importance of strict internal biosecurity measures, focusing on hygiene and preventing cross-contamination from the post-weaning period, complemented by appropriate vaccination.

VVD-PP-29

ASSOCIATION BETWEEN PRRS SEROLOGY STATUS AND ANTIMICROBIALS USAGE IN ALL AGE GROUPS IN DANISH PIG HERDS

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome (PRRS) is a significant health challenge in Danish pig herds, often leading to increased antimicrobial use related to outbreaks. The objective was to determine whether chronic PRRS infection is also associated with higher antibiotic usage and to assess the potential impact of national PRRS reduction strategies on antimicrobial consumption.

Material and Methods

A register-based study was conducted using data on PRRS serology from the surveillance database (SPF-Sund), and the VetStat database for antimicrobial prescriptions. Only conventional herds with stable PRRS serology status (positive or negative) throughout 2024 and stable herd size were included (no closure periods). Antimicrobial use was measured as the number of daily doses (ADD) per 100 animal days, and comparisons were made using Wilcoxon Rank Sum and Student's t-tests.

Results

Herds with positive PRRS status had a statistically significant higher median antimicrobial consumption compared to negative herds: 8.8% higher for sows, 8.4% for weaners (7-30 kg), and 7.7% for finishers (>30 kg). The differences were significant for both median and mean values. The distribution of antimicrobial use showed a shift towards higher consumption in PRRS-positive herds, especially near regulatory thresholds.

Discussion and Conclusion

Both sow, weaner, and finisher herds with positive PRRS status throughout 2024 exhibited significantly higher antimicrobial consumption than negative herds. For sows and weaners, the findings were consistent with previous years. For finishers the differences were significant and larger than in previous studies, most likely because this study included more robust sample sizes. The results confirm that chronic PRRS infection remains a challenge for herd health, resulting in generally higher antimicrobial use. The study's findings align with earlier research and reinforce the expectation that national PRRS reduction efforts could help lower antimicrobial consumption. However, antibiotic use is influenced by multiple factors, and reductions at the herd level depend also on broader management practices.

VVD-PP-30

DATA-DRIVEN STRATEGIES FOR CONTROLLING PORCINE CIRCOVIRUS 2 (PCV2) INFECTION IN SWINE: A MODELLING-BASED EPIDEMIOLOGICAL TOOL

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Background and Objectives

PCV2 remains one of the most impactful pathogens in global swine production. Despite the widespread use of piglet vaccination, its performance is conditioned by the timing of natural infection and the levels of maternally derived antibodies (MDA). This study aimed to develop a mechanistic, stochastic, individual-based model using the EMULSION framework to explore PCV2 dynamics and evaluate theoretical vaccination strategies.

Material and Methods

The model simulates a batch from a farrow-to-finish farm, integrating PCV2 horizontal transmission, age-dependent MDA decay, vaccine-induced immunity and clinical outcomes. The effects of PCV2-subclinical disease (SD) and PCV2-subclinical infection (SI) on average daily weight gain and mortality were modelled. Three MDA distributions (low, intermediate and high MDA) were implemented at weaning. For each MDA profile, no vaccination and five vaccination ages (14, 21, 28, 35 and 42 days of age) were simulated. Parameterisation was based on published literature data. Outputs included infection prevalence, viraemia dynamics, PCV2-SD associated mortality and growth performance.

Results

With a 5% of PCV2 infection prevalence at weaning, the optimal vaccination timing to minimise the number of PCV2-SI pigs at the end of the finishing period and maximise final body weight differed should take place at 14 days of age in pigs with low-MDA distribution. In contrast, in animals with high MDA, vaccination age should be at 35 days of age. Non-vaccinated scenarios showed a markedly higher burden of PCV2-SI, an increased occurrence of PCV2-SD cases and associated mortality, together with a final body weight 5 kg lower than that of vaccinated pigs.

Discussion and Conclusion

This modelling tool offers an adaptable and robust framework for anticipating PCV2 infection outcomes and supports data-driven optimisation of piglet vaccination strategies under diverse immunological contexts.

VVD-PP-31

ANALYTICAL COMPARISON OF RNA EXTRACTION METHODS FOR PRRSV-1 AND PRRSV-2 RNA DETECTION USING MULTIPLEX RT-QPCR

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) remains a major global challenge to swine health, requiring sensitive and reliable diagnostics. This study evaluated and compared two RNA extraction methods for detecting PRRSV-1 and PRRSV-2 using a multiplex RT-qPCR assay.

Material and Methods

Quantified PRRSV-1 and PRRSV-2 strains were spiked into PRRSV-negative serum and semen samples (individual and pooled 1:5). Serial 10-fold dilutions were extracted using two commercial kits: IDEXX RealPCR DNA/RNA Magnetic Bead Kit (Extraction Kit A) and a second leading commercial extraction (Kit B). RNA extracts were analyzed with the RealPCR PRRSV-1/PRRSV-2 Multiplex RNA Test. The limit of detection (LOD) was defined as the lowest viral concentration consistently detected in 8 of 8 replicates across two sessions.

Results

Extraction Kit A consistently detected both PRRSV strains across all sample types, demonstrating high analytical sensitivity. In individual serum and semen, LODs were 6.3 TCID50/mL for PRRSV-1 and 15.8 TCID50/mL for PRRSV-2, similar to Kit B. In pooled serum, both kits achieved a low LOD for PRRSV-1 (1.26 TCID50/mL), while PRRSV-2 detection remained at 31.6 TCID50/mL. Ct values decreased with increasing viral concentrations, consistent with qPCR dynamics. These findings confirm the sensitivity and reproducibility of both extraction protocols.

Discussion and Conclusion

Extraction Kit A showed robust performance for detecting PRRSV-1 and PRRSV-2 in serum and semen, including pooled samples. Its sensitivity matched that of Kit B, with both achieving low detection thresholds. Combined with the RealPCR assay, Extraction Kit A enables reliable and efficient molecular detection of PRRSV, supporting its use in routine diagnostics and surveillance in swine health.

VVD-PP-32

ASSESSING PREPAREDNESS FOR AFRICAN SWINE FEVER IN WILDLIFE: TWO SIMULATION EXERCISES AT LOCAL HEALTH UNIT LEVEL

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Background and Objectives

African swine fever (ASF) continues to expand among wild boar populations in Italy, posing major risks for animal health and the pig industry. To assess preparedness and response capacities in a disease-free area, the AULSS 9 Scaligera (Verona) organised simulation exercises involving Local Health Unit (LHU) personnel, the regional authority, the epidemiology unit, and local wildlife stakeholders. The exercises included the development of operational guidelines and field simulations. The objectives were to evaluate readiness, interagency coordination, and effectiveness of early detection, carcass management and containment strategies in wildlife. A second scenario aimed specifically at assessing carcass search and removal operations.

Material and Methods

The first exercise focused on the management of suspected ASF cases using a scenario involving the discovery of three wild boar carcasses within a 200m area. Conducted with the Provincial Wildlife Police, the simulation tested shared procedures under the National ASF Emergency Plan, focusing on suspicion reporting, carcass handling, and biosecurity. The second exercise involved active surveillance through structured carcass searches. The LHU engaged the Provincial Police, Carabinieri Forestali, and staff from a private company. All personnel received training on GIS applications for real-time data transmission during field operations. The exercise was conducted within a 1 km² cell of the EEA reference grid for Europe.

Results

In the first simulation, four LHU veterinarians and six Police officers were trained, with observers from other Provinces. The second simulation is ongoing and will conclude in February, to date, more than 30 participants have been trained in using open GIS-based applications.

Discussion and Conclusion

These simulation exercises confirmed the value of structured territorial monitoring as a key element for early identification and containment of ASF in wild boars. Training and clear information-sharing across institutions proved essential for overcoming operational challenges, strengthening coordination, and defining roles and responsibility to ensure rapid and coherent field response.

VVD-PP-33

NO CORRELATIONS BETWEEN PRRSV PREVALENCE AND WEATHER, MANURE TRANSPORT, OR PIG PRICES IN DUTCH SOW HERDS

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV-1) remains endemic in the Netherlands, with >90% of sow herds vaccinated. Despite extensive monitoring, factors influencing variation in neonatal PRRSV PCR positivity are unclear. Approximately 55% of sow herds have at least one PRRSV-positive farrowing batch per quarter. This study investigated potential correlations between neonatal PRRSV prevalence and external variables, including weather conditions, manure transport, and pig prices.

Material and Methods

From 2022 to 2025, 176 sow herds participated in monitoring. Neonatal samples (processing fluids, tongue fluids, umbilical cords) were tested by PCR in one of three accredited Dutch laboratories. Only PRRSV-1 positive farms were included. Monthly PRRS positivity rates were compared with pig prices (LEI), weather data (KNMI), and manure transport records (RVO) using correlation matrices. Correlation strength was categorized as very weak (0–0.19), weak (0.20–0.39), moderate (0.40–0.59), strong (0.60–0.79), and very strong (ε0.80).

Results

Correlations between PRRS prevalence and manure transport ranged from –0.04 to 0.25 (very weak to weak). Correlations with pig prices ranged from 0.15 to 0.35 (very weak to weak). Weather conditions showed correlations from –0.25 to 0.45 (very weak to moderate), with the highest between average monthly wind speed and PRRS positivity (r = 0.45), though seasonal trends did not support causation.

Discussion and Conclusion

No strong or consistent correlations were identified. Studies and local anecdotal cases linked manure pumping and slurry fertilization to PRRS outbreaks; we hypothesized manure transport as a proxy. Associations were weak, likely due to endemic conditions and high sow vaccination reducing outbreak impact. The moderate association with wind speed may reflect effects on barn climate rather than direct causation. Limitations included incomplete sequence data and lack of continuous monitoring, which hindered outbreak detection and strain differentiation. Continuous PRRSV surveillance is recommended to improve outbreak recognition and optimize sample selection for sequencing.

VVD-PP-34

PRRS STATUS IN PROCESSING FLUIDS CORRELATE MODERATELY STRONG WITH LIVE BORN PIGLETS AND LITTER WEIGHT AT WEANING

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Background and Objectives

Processing fluids are a cost-effective tool for monitoring a herds PRRS status. Since PRRS can affect reproductive performance of sows, PRRS status of processing fluids are likely correlated with number of piglets born alive and might also have predictive value for lactation performance.

Material and Methods

Between July 2024 and July 2025, 15 batches of processing fluids were sampled from one farm and tested with PRRS PCR (Indical Virotype PRRSV 2.0 RT-PCR Kit) at Merefelt Livestock Diagnostics. Additionally, litter weight was calculated by total batch weight of weaned piglets divided by number weaned. Sow management data was exported for monthly data on live born piglets and number of piglets weaned per sow. All data was analysed using SAS 9.4 with PRRS PCR Ct status coded as positive/negative (0/1).

Results

Out of 15 tested samples, four tested positive for PCR, with Ct values ranging between 24,65 and 30,51. Positive PCR tests were detected in 4 subsequent submitted samples between January 2025 and April 2025. Average litter weight was 104,7kg in PRRS PCR negative batches and 96,38 kg in PRRS PCR positive batches. There was a significant negative correlation coefficient for all outcomes. Live born, litter weight and number weaned had a correlation coefficient of -0,66 (p=0,0067), -0,66 (p=0,0072) and -0,69 (p=0,0042) respectively with PRRS PCR Ct status.

Discussion and Conclusion

In batches where processing fluids tested positive in PRRS PCR, the number of live born and weaned piglets, as well as litter weight at weaning were lower when compared to batches testing negative. Key-limitations of this study include small sample size, potential temporal clustering and lack of adjustment for confounders. Although correlation does not imply causality, the observed associations are biologically and clinically plausible. Despite limited data, processing fluid monitoring signals PRRS impacts and supports timely decisions.

VVD-PP-35

ASSESSING THE DIAGNOSTIC PERFORMANCE OF FILTRATION AND CYCLONIC AIR COLLECTION FOR PRRSV DETECTION IN UNSTABLE HERDS

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Background and Objectives

The complex epidemiology of PRRS Virus infection makes continuous surveillance essential. Airborne sampling within swine facilities has shown promising results. However, variability in sampling technologies, together with heterogeneous PRRSV health statuses across farms, complicates standardization of reliable surveillance purposes. We compared two air sampling approaches, filtration vs cyclonic collection, in swine farms with different PRRSV health statuses.

Material and Methods

Air samples were collected concurrently in the same air space from transition rooms of nine farms housing four- to five-week-old piglets. Based on a three-month monitoring period using tongue samples from dead-born piglets, eight farms were classified as high-prevalence unstable (HPU) and one as low-prevalence unstable (LPU). Filtration was performed using an MD8 Airport (4 and 6 m^3), while cyclonic collection used a Coriolis µ (4, 6, and 24 m^3). Samples were analyzed by PRRSV qPCR. Logistic regression was used to evaluate detection and differences in the viral load between sampling methods.

Results

PRRSV was detected using both approaches. Cyclonic collection yielded positive results in all farms, whereas filtration detected PRRSV in 8 of 9 farms. At equivalent air volumes, filtration yielded lower mean Ct values (33.3 vs 35.5), although differences were not statistically significant ($p > 0.05$). When sampling 6 m^3 of air, filtration showed a significantly higher proportion of positive samples compared to cyclonic collection ($p < 0.005$). Cyclonic collection enabled sampling larger air volumes, achieving detection rates comparable to filtration when 24 m^3 were collected, in shorter sampling times.

Discussion and Conclusion

Both air sampling methods were suitable for PRRSV detection in unstable herds. However, the limited sample size and the absence of parallel animal sampling to confirm piglet infection status represent important limitations. Therefore, results should be interpreted as exploratory, and further studies are needed to better define the role of air sampling in PRRSV surveillance programs.

VVD-PP-36

FIELD EVALUATION OF A NEXT-GENERATION PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS TYPE 2 (PRRSV2) MODIFIED LIVE VIRUS (MLV) VACCINE COMPARED WITH A CONVENTIONAL PRRSV1-MLV VACCINE IN A DUAL-TYPE PRRSV INFECTED COMMERCIAL FARM

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome (PRRS) is one of the most economically significant diseases in the swine industry, causing reproductive losses and respiratory disorders. Despite the widespread use of conventional MLV vaccines, PRRS outbreaks persist due to the virus's high mutation rate and ongoing evolution. A next-generation PRRS2-MLV vaccine developed using Codon Pair Deoptimization (CPD) technology provides enhanced safety, cross-protection, consistent immunogenicity and genetic stability. This study evaluated its field efficacy in growing pigs compared with a conventional PRRSV1 MLV vaccine under dual-type PRRSV infected farm conditions.

Material and Methods

The trial was conducted on a 2,000-sow, 3-site production system in Thailand with a history of both PRRSV1 and PRRSV2 infections. Two-week-old piglets were randomly allocated into: group1 (n=929) received a conventional PRRSV1 MLV vaccine, and group2 (n=935) received the next-generation PRRS2-MLV vaccine (Persoporc®, Ceva, France). Number of dead and culled pigs were analysed using Fisher's exact test. Growth performance was recorded during the nursery and fattening phases, and economic benefits were evaluated using Gompertz standardization and current local prices.

Results

During nurseries, total losses were 1.08% for group1 and 0.22% for group2 ($P<0.05$), and 2.79% and 1.80% during fattening, respectively. The average daily gain was 458 vs 507 g/pig/day during nurseries and 767.75 vs 782.16 g/pig/day during fattening, with corresponding feed conversion ratio values of 1.42 vs 1.40 and 2.50 vs 2.48, respectively. The net profit per pig was 46.1€ for group1 and 54.4€ for group2; 8.3€/pig in favour of the next-generation PRRSV2-MLV vaccine.

Discussion and Conclusion

Under dual-type PRRSV strain circulation, pigs vaccinated with Persoporc® demonstrated reduced mortality and improved growth performance compared with a conventional PRRSV1 MLV vaccine. These findings highlight the superior field efficacy of the next-generation PRRSV2-MLV vaccine in enhancing production outcomes in commercial swine herds.

VVD-PP-37

PORCINE HEMAGGLUTINATING ENCEPHALOMYELITIS VIRUS AND A NOVEL ASTROVIRUS CO-INFECTION IN PIGLETS WITH RESPIRATORY DISEASE

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Background and Objectives

Respiratory disease in pigs is common worldwide. Traditionally, disease has been associated with single pathogens. Multiple microorganisms are now increasingly thought to contribute to disease in what is known as the porcine respiratory disease complex (PRDC). With the increasing availability of sophisticated diagnostic methods, such as whole-genome sequencing, previously undetected microorganisms can now be identified. The study aims to describe novel viruses detected in Swedish pigs with respiratory disease.

Material and Methods

Clinical samples (n=4) were submitted to SVA for diagnostics as part of routine veterinary HERD HEALTH MANAGEMENT AND ECONOMY from a Swedish pig farm with three- and eight-week-old piglets showing clinical signs of respiratory disease. Samples were initially tested with qPCR for several respiratory pathogens included in the routine diagnostic workflow: Actinobacillus pleuropneumonia (APP), Glaesserella parasuis (Gps), Mesomycoplasma hyorhinis (Mhr), Mesomycoplasma hyopneumoniae (Mhy), Pasteurella multocida (Pm), and swine influenza A (SIV). In addition, Illumina sequencing (2x75 nt) was performed. The Illumina reads were quality trimmed and assembled using SPAdes v. 3.15.4. The resulting contigs were then classified using DIAMOND v. 2.0.9.

Results

All four pigs were PCR-positive for Mhr and Gps. Three pigs were also PCR-positive for APP, two for Mhy and Pm, and one for SIV. Deep sequencing revealed that several pigs were co-infected with a variant of the betacoronavirus Porcine Hemagglutinating Encephalomyelitis Virus, a virus previously not found in Sweden, and a novel astrovirus 4.

Discussion and Conclusion

Astroviruses are well known to be associated with enteric disease or asymptomatic infection. However, the astrovirus detected in this study had the closest sequence similarity to recently characterized porcine astrovirus 4, which displayed respiratory epitheliotropic infection in young pigs in the USA. The detection of these previously undescribed viruses in Sweden further adds to the complexity of PRDC. However, their contribution to clinical disease remains to be verified.

VVD-PP-38

VALIDATION OF THE ENZYMATIC HYDROLYSIS PROCESS OF PORCINE PLASMA AS SAFETY STEP FOR INACTIVATION OF PORCINE EPIDEMIC DIARRHOEA VIRUS (PEDV), PORCINE REPRODUCTIVE AND RESPIRATORY VIRUS (PRRSV) AND PORCINE CIRCOVIRUS-2 (PCV-2)

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Background and Objectives

A commercial product is based on bioactive peptides obtained through enzymatic hydrolysis of porcine plasma. This study evaluated whether the enzymatic hydrolysis process can inactivate PEDV, PRRSV and PCV-2 inoculated into liquid plasma prior to hydrolysis.

Material and Methods

PEDV CV777 was propagated in VERO cells, PCV-2 isolated Sp-10-7-54-13 in PK-15 cells, and PRRSV VP21 in MARC-145 cells. A total of 1.5 kg of bovine plasma (used to avoid antibodies against the target viruses) was divided into three 0.5 L sub-batches. Plasma was heated to 50°C under stirring, protease was added, and each sub-batch was inoculated with 50 mL of virus. Hydrolysis was conducted for 5 h under optimal temperature and pH conditions, with all procedures performed in triplicate. Samples collected before and after hydrolysis were stored at −75°C. Infectivity was assessed in the respective target cell lines using a microtiter assay. PEDV detection relied on cytopathic effect (CPE) whereas PCV-2 and PRRSV were analysed by quantitative PCR, comparing Ct values at 0 and 3 dpi to evaluate potential viral replication.

Results

For PEDV, CPE was detectable at T0 up to dilution −3, while no CPE was observed after 1–5 h of hydrolysis, indicating loss of infectivity due to enzymatic treatment and/or temperature. For PCV-2 and PRRSV, quantitative PCR analysis of triplicates at T0, T1 and T5 showed no decrease in Ct values, indicating lack of viral replication and suggesting that detected genomes were non-infectious. Cytotoxicity across cell lines limited culture-based detection for PCV-2 and PRRSV.

Discussion and Conclusion

PEDV was inactivated during enzymatic hydrolysis, while PCV-2 and PRRSV showed no evidence of replication after treatment. Overall, enzymatic hydrolysis of liquid plasma appears to stop or substantially limit viral replication, although further studies are needed to confirm complete inactivation.

VVD-PP-39

SWINE INFLUENZA STRAINS (SWIAV) DETECTED IN SAMPLES FROM SWINE IN THE UNITED KINGDOM BETWEEN JANUARY 2020 AND OCTOBER 2025

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Background and Objectives

Swine influenza A virus (swIAV) continues to cause significant economic losses to the pig industry, while also posing a zoonotic risk that requires continuous monitoring. Previous UK studies have shown a high level of influenza circulation within commercial herds, highlighting the importance of ongoing diagnostic surveillance. Identifying circulating subtypes is essential for selecting the most appropriate vaccination strategy, guiding future vaccine development, and assessing any potential public-health implications.

Material and Methods

Nasal swabs were collected by UK veterinary practitioners from pigs exhibiting clinical signs consistent with influenza infection. Samples were submitted to Innovative Veterinär Diagnostik (IVD) GmbH in Hannover, Germany, for PCR testing (VetMAX-Gold Influenza SIV-PCR swine). Results were reported as negative, weakly positive (Ct 38–40), or positive (Ct <38). Samples with a Ct-value <30 underwent subtype identification using PCR (SIV Influenza Subtypisierung Multiplex-PCR, Henritzi et al., 2016).

Results

A total of 364 submissions comprising 2,413 nasal swabs, were analysed between January 2020 and October 2025. Most submissions consisted of pooled nasal swabs (typically 3–5 swabs per pool).Influenza A virus was detected in 156 submissions (43%), with 308 samples testing positive. Subtyping yielded 144 subtype identifications, consisting of 69 H1huN2 (47.9%), 44 H1pdmN1 (30.6%), 11 H1avN1 (7.6%), 10 H1avN2 (6.9%), 5 H1huN1 (3.5%), 5 H1pdmN2 (3.5%).

Discussion and Conclusion

The detection of influenza A virus in 43% of submissions confirms that IAV remains commonly identified in UK herds. H1huN2 was the predominant subtype, with pandemic-derived strains such as H1pdmN1 also frequently observed. Avian-like subtypes (H1avN1, H1avN2) were consistently present but at lower levels. The diversity of subtypes recorded highlights the continuous co-circulation of multiple viral lineages in the UK pig population. These findings emphasise the importance of sustained diagnostic surveillance to support informed vaccine choice and to monitor strains with potential zoonotic relevance.

VVD-PP-40

PCV2 GENOTYPE DISTRIBUTION IN PCR PCV2 POSITIVE SAMPLES COLLECTED IN FLANDERS

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Background and Objectives

Porcine circovirus (PCV2) comprises nine identified genotypes (PCV2a–i), of which PCV2d has become the predominant genotype globally. A previous study conducted in 2018 demonstrated that PCV2d was detected in 83,3% (45/54) of PCV2 PCR-positive tissue samples submitted to the Flemish Animal Health Service (DGZ Vlaanderen). The aim of this present study was to investigate the current PCV2 genotype distribution in PCV2-positive samples collected from presumed porcine circovirus (PCVD) clinical cases in Flanders in 2025.

Material and Methods

To characterize the current PCV2 field strains, 22 samples were selected from DGZ Vlaanderen and 32 from Dialab. The samples included blood sera, lungs, lymph nodes, trachea-bronchial swabs (TBS), fetuses and oral fluids submitted for analysis with a PCV2 quantitative PCR between January and September 2025. The absolute concentration in each PCR reaction was recalculated to copies/g or ml sample. The PCV2 genotypes were identified by PCR detecting PCV2a, PCV2b and PCV2d.

Results

In total, 54 samples from 53 different farms were genotyped. Sample types included 30 lung tissues, 12 blood sera, 6 lymph nodes, 3 fetal tissues, 2 oral fluids and 1 TBS. The detected PCV2 viral loads ranged from 10^3 to 10^{13} genome copies/ml or g. Of the 54 genotyped PCV2 samples, 8 (14,8%) were identified as PCV2a, 2 (3,7%) as PCV2b, 32 (59,3%) as PCV2d, 11 (20,4%) contained PCV2a and PCV2d and 1 (1,9%) contained both PCV2b and PCV2d. Overall, PCV2d was identified in 44 out of 54 samples (81,5%).

Discussion and Conclusion

The findings of this study confirm that PCV2d remains the predominant genotype circulating in Flanders. Furthermore, the detection of multiple genotypes within individual samples suggests co-infection or concurrent circulation of distinct PCV2 strains within the same herd.

VVD-PP-41

PRELIMINARY STUDY ON DIFFERENT METHODS TO DETECT INFLUENZA A VIRUS IN ITALIAN PIG HERDS

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Background and Objectives

This preliminary study compares different sampling methods to monitor the presence of Swine Influenza A viruses (IAV-S) in ten Northern-Italian farms.

Material and Methods

Visits were conducted in autumn 2025, in farms with ongoing clinical symptoms or with historical circulation of IAV-S. Respiratory clinical score (RCS, 1-3) was used to evaluate whether the farm was acutely affected by respiratory syndrome. Then, in the same pens both nasal swabs (NS) (30/farm, analysed in pool of 5) and oral fluids (OF) (5 ropes/farm) were collected. Conversely, air sampling was performed using Sartorius MD8-AirPort device (50L during 45 min) inside and outside the building. Samples were screened for IAV-S by real-time RT-PCR and positive samples were molecularly subtyped via nested RT-PCR.

Results

At least one sample tested positive in 9/10 farms, even though in 7/10 farms RCS was 1. Overall, 57% of NS tested positive, whereas the prevalence in OF was 43%, with discrepancy observed in only two farms. Indoor air sampling never yielded Ct value below 30 (30% of samples with Ct 30–35, all with forced ventilation), while 80% of outside air samples were negative. In most of the positive farms, a single strain was detected from NS and/or OF (5 H1CN1, 1 H1CN2, 1 H1AN1). Interestingly, in one farm, partial subtyping of 1 air sample (H1A) was performed, with H1CN2 positivity in NS and OF.

Discussion and Conclusion

IAV-S was often present without relevant respiratory clinical signs. NS are considered the gold standard for detection, and OF confirmed their potential for group monitoring. Except for one farm, all sampling methods confirmed the circulation of a single viral subtype only. Further statistical analysis is crucial to determine the significance of these findings and whether OF and air monitoring can be considered reliable alternatives to NS in future diagnostic and surveillance protocols.

VVD-PP-42

MOLECULAR DIVERSITY PRRSV IN SWINE FARMS OF JALISCO, MEXICO

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Background and Objectives

PRRSV continues to be one of the most significant health challenges in swine production, especially in areas with high animal density. Sequencing the ORF5 region remains a key tool for evaluating viral diversity and understanding evolutionary dynamics. Additionally, identifying farm-level risk factors is essential for establishing effective control measures. The objective of this study was to PRRSV detection and to describe the genetic diversity of circulating strains in swine farms across Jalisco, Mexico.

Material and Methods

Between 2022 and 2023, sampling was conducted on 80 farms distributed across four regions categorized by swine population density (A-9.46, B3-135.4, B1-210.36 and B2-261.65 pigs/km^2). A total of 4,207 serum samples were obtained from different production stages and subsequently grouped into 844 pools for ORF7 qRT-PCR testing. Pools with Ct values <30 were selected for ORF5 amplification via endpoint RT-PCR, followed by Sanger sequencing.

Results

Positive pools were most frequently detected in weaning (61.1%), followed by growing (40.4%) and lactation (38.2%). The highest positivity occurred in region B2 (44.6%), the area with the greatest pig density. A total of 39 ORF5 sequences were obtained and assigned to lineages L1A, L1C, L1I, L2, L5A, L8C, and L8D (GenBank Accession PV235482 to PV235520). L1A accounted for 53.8% of the sequences and showed low intra-lineage diversity (3.6%).

Discussion and Conclusion

The detection of several co-circulating lineages demonstrates heterogeneous viral movement across the region. Overall, PRRSV circulation in Jalisco appears to be driven mainly by high pig density, insufficient biosecurity, and inconsistent vaccination practices. The predominance of lineage L1A, together with the concurrent presence of additional lineages, indicates ongoing viral introduction and underscores the need to reinforce access control and optimize vaccination programs to mitigate the epidemiological impact of the virus. This work was supported by IPVS Association México 2014 A. C. SIGI 1520226989.

VVD-PP-44

NO EVIDENCE OF PORCINE CIRCOVIRUS 4 IN THE SAMPLES COLLECTED FROM DOMESTIC PIGS IN POLAND

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Background and Objectives

Porcine circovirus (PCV) 4 was first described in 2019. To date, PCV4 DNA has been detected in samples from pigs reared in Spain and the US. Studies assessing the circulation of PCV4 have been performed in only nine countries worldwide, resulting in a significant knowledge gap in the subject of the geographic distribution and epidemiology of PCV4. Therefore, this study aimed to assess the presence of PCV4 in samples obtained from pigs in Poland.

Material and Methods

DNA was extracted from 476 serum samples collected from pigs of different ages (168 piglets, 100 weaners, 100 fatteners, 106 sows) reared in 10 breeding, intensive farms localised in 6 provinces (voivodeships) of Poland and subjected to real-time PCR for the presence of PCV4 DNA. A 130 bp fragment of the NC_055580.1 sequence within the Rep gene was chemically synthesised, cloned into the pCRScript Amp SK plasmid, and used as a positive control, as no virus isolate was available. Primers and probes were newly designed using Primer3Plus, and their sequences are presented below. Reactions were performed using IndiMix JOE (Indical Bioscience, Germany). The primers and probes designed for the study were as follows: PCV4 F: GAAAGCGCAGCGACCTTA (position 397-414); PCV4 R: CCACGCCCATACCTTATAAAT (position 482-502); PCV4 probe: 6-Fam-TGGCCCGTCGTGAGTTCCCGTCT-BHQ-1 (position 459-479); PCV4 control: GAAAGCGCAGCGACCTTAAAGCGGCTGTGGCCGCCCTGAATGCCGGCAGCTCAATGAGTGAAGTGGCCCGTGAGTTCCCGTCTGTATT TATAAGGTATGGGCGTGGCCTCCGGGACTACGTCATTA CTGC (position 397-526). The reaction efficiency was established at the level of 98%.

Results

No PCV4 genetic material was detected in any of the samples, indicating that the virus is not currently circulating in this particular population in the geographical area studied.

Discussion and Conclusion

Although this study found no PCV4 DNA in samples collected from domestic pigs from Poland, further research using a broader range of samples from various animal species—including domestic pigs and wildlife—is needed to confirm and expand on these findings.

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VVD-PP-45

ENHANCED CONTROL AFRICAN SWINE FEVER VIRUS BY PARAFORMIC ACID COMPARE TO FORMALDEHYDE: IN VITRO STUDY

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Background and Objectives

African swine fever virus (ASFV) remains one of the most devastating threats to global pig production. Breaking transmission routes with effective biosecurity agents is a primary objective. Paraformic acid (PFA), a non-corrosive, non-irritant precursor of formic acid, has demonstrated strong antimicrobial activity, but data on its efficacy against ASFV are lacking. This study evaluated the in vitro virucidal activity of a PFA-based solution against ASFV and compared its efficacy with formaldehyde.

Material and Methods

An ASFV field was isolated from diseased pigs in Vietnam was confirmed by PCR and sequencing of the p72 gene. Virus suspension (10^5 HAD_{50}/mL) was incubated 1:1 with PFA (provided by Numega Nutrition Sdn Bhd, Malaysia) solution (final concentrations 0.2-5.0 mL/L) at 37°C for 15, 30 or 60 mins. Residual infectivity was determined on susceptible cell cultures by the haemadsorption ("rosette") test, scored from "-" (no rosettes) to "++++" (maximal rosettes). In a comparative assay, PFA (4.5 and 5.0 mL/L) was tested alongside formaldehyde (3.0 and 3.3 mL/L). Cultures were monitored for up to 120 h to detect any re-emergence of ASFV activity.

Results

PFA at 1.5 mL/L reduced rosette scores versus control. At 5.0 mL/L, PFA completely abolished rosette formation after 60 mins, with no ASFV activity detected thereafter. In the comparative assay, both PFA (4.5 and 5.0 mL/L) and formaldehyde (3.0 and 3.3 mL/L) eliminated detectable rosettes within 15 mins and remained negative for up to 120 h, with no evidence of viral reactivation.

Discussion and Conclusion

PFA rapidly inactivated ASFV in vitro in a dose and time dependent way and worked as well as formaldehyde. These results suggest that PFA is a safe and effective tool to improve biosecurity and reduce ASFV contamination risk in feed manufacturing and pig production systems.

VVD-PP-46

STUDY TO SEARCH FOR ASSOCIATIONS BETWEEN BIOSECURITY MEASURES AND PRRS STATUS OF SOW HERDS IN THE NETHERLANDS

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome (PRRS) remains a major challenge for swine production in the Netherlands. This study investigates the association between biosecurity practices and PRRS status (as indicated by Ct values) in Dutch sow herds.

Material and Methods

A cross-sectional biosecurity survey was conducted among 19 sow farms in the Netherlands using Combat®. Data were collected on internal and external biosecurity measures. PRRS status was determined by PCR Ct values on samples of neonatal piglets, piglets just after weaning and piglets at the end of nursery in a period of 8 weeks around the time of the biosecurity audit. Farms were categorized into low (Ct <30.9), medium (31<Ct<35), and high (Ct>35) Ct groups. Possible assocations were demonstrated using the Pearson correlation coefficient (r).

Results

A strong negative correlation was found between the number of farms within 3 km and the Ct value end of nursery on a farm (r=-0,6488, p= 0,0089). Farms with medium to high Ct values tended to be located further from the nearest pig farm (3–8 km).All farms introduced gilts, but only one routinely tested them for PRRS prior to introduction. A weak negative correlation was found between the length of the quarantine period on the farms and the Ct value end of nursery. (r= -0,3934, P=0,1469)

Discussion and Conclusion

The findings suggest that greater distance to other pig farms and longer quarantine periods are associated with higher Ct values. Many biosecurity practices were inconsistently applied across farms. This study could only assess associations, not causality. It remains a chicken and egg scenario: do farms adopt more biosecurity due to recent PRRS outbreaks, or do those without outbreaks reduce measures. Future research should prioritize standardizing biosecurity protocols to enhance herd health.In all farms the planned discussion on results created more awareness. In many cases biosecurity action points were formulated.

VVD-PP-47

A NATIONAL CONTROL PROGRAMME FOR PORCINE RESPIRATORY REPRODUCTIVE SYNDROME VIRUS ON ISLAND OF IRELAND PIG HERDS

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Background and Objectives

PRRSv-1 is an endemic disease in the UK and Ireland pig herds causing significant economic loss to the swine industry. PRRS is characterised by sow reproductive disease, immunosuppression and respiratory diseases leading to secondary disease infections and porcine respiratory disease complex. PRRSv RNA genome is highly divergent with high mutation rates and recombination events permitting the continuous global emergence of new virulent strains. The recently commenced PRRS control programme incorporates synchronised vaccination, biosecurity measures with serological and molecular testing for PRRSv alongside parallel testing for influenza A&D and porcine circovirus 2-4. Primary goal of PRRSv prevalence reduction beneficial effects will be across animal health, antibiotics usage and production parameters.

Material and Methods

A two-stage approach was followed by pre-screening at slaughter for a proportion of the farms retaining only seropositive ones. Farms that weren't screened at slaughter were also included in the study totalling N.Ireland at n=95 farms and RoI n=17 (pig dense region pod). 10-12wks aged pigs were sampled for verification PRRSv qPCR, inclusive of PCV2-4 (n=30 sera) and influenza A&D (n=4 oral fluid) per farm (12 of 95 NI farms didn't submit oral fluids). Positive PRRSv-1 samples ORF5/ORF7/NSP2 genes were sequenced, phylogenetically analysed determining wild-type or vaccine strains. PRRSv whole genome sequencing by 3'-poly-A-tails transcriptomics and targeted amplification are in development for complete genome recombination detection and phylogenomics.

Results

Analysis to date found N.Ireland PRRSv at 68% positive (n=65 positive farms), with ORF5/ORF7/NSP2 sequencing determining n=39 wild-type, n=21 vaccine-like virus and n=5 untyped. The wild-type strains were phylogenetically designated as PRRSv-1 lineages L1.1 to L.1.3. Influenza A N.Ireland samples were 36% positive (n=30 farms) with 24% (n=4) in RoI.

Discussion and Conclusion

The prevalence and molecular characterisation of PRRSv strains will be established for the Island of Ireland with data generated incorporated into other NCP measures and metadata to reduce the PRRSv-1 prevalence.

VVD-PP-48

COINFECTION OF PORCINE CIRCOVIRUS (PCV2, PCV3, PCV4) AND PRRSV IN FARMS IN JALISCO, MEXICO.

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Background and Objectives

Porcine circovirus (PCV) is a ubiquitous viral agent in pigs. Currently, the genus Circovirus comprises four species: PCV1, PCV2, PCV3, and PCV4. Problems associated with the presence of new Circovirus types have recently been described on farms, so the objective of this study was to identify coinfection with PCV2, PCV3, PCV4, and PRRSV in pig farms in the state of Jalisco.

Material and Methods

In Jalisco, 80 commercial farms participated in the study, distributed across four regions according to animal density. A total of 4,207 serum samples were taken from clinically undetected pigs. An average of 35 samples were obtained per farm, distributed by production stage: lactating, weaned, growing, developing, finishing, and pregnant sows. The samples were pooled into groups of 5 serum samples. DNA and RNA were extracted from each pool (n=844) using commercial columns (QIAGEN). The DNA was analyzed by qPCR to detect ORF2 for PCV2 and PCV4, ORF1 for PCV3, and ORF7 for PRRSV, in order to identify positive samples, defined as those with a Ct <35.

Results

The most frequently detected infection was PRRSV with 305 samples (36.13%), followed by PCV2 with 235 (27.28%) and PCV3 with 205 (24.28%). Coinfections involving PCV2 and PCV3 were present in 55 samples analyzed, while triple coinfection (PCV2-PCV3-PRRSV) occurred in 2.72%. The highest proportion of positive samples was found in the weaning stage for PRRSV (61.07%), the development stage for PCV2 (39.47%), and the growth stage for PCV3 (32.91%). The three positive samples for PCV4 were found in each of the aforementioned stages.

Discussion and Conclusion

PCV4 was detected in three serum samples. PCV2-PCV3-PRRS coinfection is an event identified in low percentages, but present in pigs without clinical signs. Active surveillance is necessary to associate the presence of coinfection with clinical signs related to the presence of these viruses. Acknowledgments: IPVS-Mexico-Association-2014 SIGI1520226989.

VVD-PP-49

PCV2 TRANSMISSION DYNAMICS: CORRELATION BETWEEN GILT STATUS AT BREEDING AND PIGLET STATUS POST-WEANING

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Background and Objectives

Porcine circovirus type 2 (PCV2) is a major pathogen in swine, responsible for porcine circovirus-associated diseases (PCVAD). Transmission from sows to piglets is a key factor in herd infection dynamics. This observational study investigates the correlation between the PCV2 status of gilts at breeding and that of their weaned piglets, using oral fluid (OF) samples analyzed by PCR.

Material and Methods

This observational study included 69 Danish swine herds, selected by practicing veterinarians with a specific interest in PCV2 transmission dynamics. Herd selection was semi-random, based on the veterinarians' desire to investigate infection patterns.
For each herd, four ropes were placed among gilts at breeding, and the resulting OFs were pooled into a single sample. Similarly, four ropes were provided to weaned piglets per herd, with OFs pooled into one sample per herd. Piglet samples were collected at various intervals post-weaning, ranging from 1 to 42 days (median 6.0 days; mean 7.02 days). All pooled samples were analyzed for PCV2 by PCR.

Results

Among 23 herds with PCV2-positive gilts at breeding, 11 had PCV2-positive piglets post-weaning, while 12 had PCV2-negative piglets.
Of 46 herds with PCV2-negative gilts, five had PCV2-positive piglets and 41 had PCV2-negative piglets.
Chi-square analysis showed a significant correlation between gilt and piglet PCV2 status ($Chi2 = 9.774$, $p = 0.002$).
These results indicate that the PCV2 status of gilts at breeding significantly impacts the PCV2 status of their weaned piglets.

Discussion and Conclusion

In this observational study, a significant association was found between gilt PCV2 status at breeding and piglet PCV2 status post-weaning. Herds with PCV2-positive gilts at breeding tended to have a higher prevalence of PCV2-positive piglets after weaning compared to herds with PCV2-negative gilts.

VVD-PP-50

EARLY PRRSV-INDUCED ANEMIA AND LUNG DAMAGE: WHY THESE INITIAL LESIONS DEFINE RECOVERY, PERFORMANCE, AND HERD HEALTH

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) continues to pose significant challenges to swine production through hematological alterations, respiratory pathology, and reduced growth performance. This study aimed to characterize longitudinal hematological changes and lung lesion severity following PRRSV infection and to evaluate outcomes in pigs receiving a combined supportive intervention.

Material and Methods

Twenty-one weaned pigs (4 weeks old) were allocated into three groups: a negative control (n = 5), a positive control challenged with a PRRSV Lineage 1 strain (n = 8), and an intervention group consisting of pigs pre-vaccinated against PRRSV (Prevacent™) and supplemented with Swine Awake® during the challenge period (n = 8). Blood samples were collected at 0, 7, 14, and 21 days post-infection (DPI) for complete blood count (CBC) analysis, including red blood cell count (RBC), hemoglobin (HGB), and hematocrit (HCT). At 21 DPI, macroscopic lung lesion scoring was performed. Longitudinal data were analyzed using repeated-measures statistical models, with group comparisons conducted at each time point.

Results

PRRSV-challenged pigs in the positive control group exhibited significant reductions in RBC, HGB, and HCT at 7 DPI compared with the intervention group ($p < 0.05$), indicating early PRRSV-associated anemia. Hematological values partially recovered by 14 and 21 DPI, although levels remained lower in the positive control group relative to the intervention group. Lung lesion severity at 21 DPI was markedly greater in the positive control group (38.44 ± 17.62) compared with minimal lesions observed in the intervention group (4.75 ± 3.41; $p < 0.001$), while no lesions were detected in the negative control group.

Discussion and Conclusion

PRRSV infection was associated with early hematological depression and severe lung pathology, with partial recovery observed over time. The combined intervention was associated with reduced anemia and lung lesions under these experimental conditions. These findings highlight the importance of early health management strategies to support recovery and mitigate disease-associated impacts in PRRSV-affected herds.

VVD-PP-51

IMPACT OF SAMPLE MATERIAL AND DIAGNOSTIC LABORATORY ON NEONATAL PRRS PCR MONITORING RESULTS

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Background and Objectives

Effective control of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) requires early detection in neonatal piglets. Common sample matrices for PCR monitoring include processing fluids (PF), tongue fluids (TF), and umbilical cord fluids (UC). However, comparability of qualitative (positive/negative) and quantitative (Ct value) results across sample types and diagnostic laboratories remains unclear. This study evaluated whether PRRSV-1 PCR results from neonatal samples are consistent across materials and laboratories.

Material and Methods

From 2024 to 2025, neonatal piglets from 152 PRRSV-1 infected sow herds in the Netherlands were sampled at farrowing batch level. Farm staff collected PF, TF, or UC fluids, pooled (δ60 litters per pool), and submitted samples to one of two commercial accredited laboratories. PCR testing was performed, and qualitative and quantitative results were analyzed for comparability (Chi square and Wilcoxon used).

Results

A total of 2,680 samples were analyzed. PCR positivity rates were similar between laboratories: Merefelt (21.3%) and VLG (24.2%) (X^2 test; $p > 0.05$). However, Ct values differed significantly: Merefelt mean 27.2 ± 3.9 vs. VLG 29.9 ± 4.5 (Wilcoxon; $p < 0.05$).
By sample type per lab. **Merefelt:** PF (1,076 samples, 21.7% positive), TF (300 samples, 16.7%), UC (232 samples, 25%). Ct means for positives: PF 27.8, TF 26.3, UC 26.1. **VLG:** PF (825 samples, 25.2%), TF (247 samples, 20.6%). Ct means: PF 29.9, TF 30.2.
No significant differences in positivity between sample types within each lab (Fisher's test; $p > 0.05$). UC samples were only processed at Merefelt. Quantitative Ct values were not directly comparable across labs due to inter-laboratory variability.

Discussion and Conclusion

Positivity rates in pooled neonatal piglet samples were consistent across sample types and laboratories, supporting flexibility in qualitative PRRSV-1 monitoring. However, Ct values varied significantly between labs, indicating caution when interpreting quantitative PCR data across diagnostic settings.

VVD-PP-52

SIZE OF PIG PREMISES DIAGNOSED WITH PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME THROUGH THE GREAT BRITAIN SCANNING SURVEILLANCE NETWORK

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Background and Objectives

Porcine reproductive and respiratory syndrome (PRRS) due to PRRSV-1 is an important endemic pig disease in Great Britain (GB). We examined the size of pig premises of origin for submissions of samples and carcasses diagnosed with PRRS. Submissions were for voluntary Government-subsidised testing through the GB scanning surveillance network.

Material and Methods

We extracted surveillance data from 2014-2024 for submissions in which PRRS was diagnosed, alongside the same data for submissions from which PRRS could have been diagnosed ("diagnosable submissions" which provide a denominator). Pig movement data and size estimates for each premises were provided by APHA's Livestock Demographic Data Group (LDDG). County Parish Holding numbers and postcodes for submissions were matched with the LDDG pig population dataset and statistical analyses were completed.

Results

Data relating to 1088 diagnoses and 7217 diagnosable submissions were extracted. A diagnosable submission from a larger size category premises (>2000 pigs moved in two-year period) had 7.8 times higher probability of being diagnosed with PRRS than one from a smaller size category premises ($p_{chi\text{-}sq}<0.01$). The diagnostic rate of PRRS was higher for the largest category holding than each of the other categories ($p_{chi\text{-}sq}<0.01$). The bi-yearly mean total pigs moved for submissions diagnosed with PRRS (43813.36) was significantly higher than the mean for diagnosable submissions (38139.75; $p_{t\text{-}test}<0.01$). The lowest number of pigs moved for any one holding on which PRRS was diagnosed was 70-80 pigs moved over two years, for which the provided herd size was 600-610 pigs.

Discussion and Conclusion

Notwithstanding limitations of the datasets, these findings demonstrate value in combining GB scanning surveillance network and LDDG datasets to fill data gaps and provide inferences about the characteristics of particular diagnoses, where prevalence data do not exist. Such analyses could inform the suitability of proposed interventions and provide an evidence base for policy decisions relating to disease control.

VVD-PP-53

SWINE INFLUENZA SURVEILLANCE FROM JANUARY TO OCTOBER 2025 IN PORTUGAL AGE-GROUP SAMPLING PROTOCOL

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Background and Objectives

Swine influenza A virus (swIAV) remains a major health concern in commercial pig production, with considerable implications for productivity and animal welfare. The virus circulates in multiple subtypes, and its detection can be challenging, especially in endemically infected herds without clear clinical signs. This study aimed to apply an age-group based sampling strategy, as described by Lillie-Jaschniski et al. (2022), to evaluate the prevalence and subtype diversity of swIAV in Portuguese sow farms.

Material and Methods

From January to October 2025, 50 sow farms in Portugal from 19 companies where sampled (7 farms were sampled twice, 1 sampled three times), following the protocol by Lillie-Jaschniski et al., nasal swabs were collected from three distinct age groups (if present): suckling piglets, weaners, and nursery pigs. In each group, 10 nasal swabs were pooled for analysis. Detection of influenza A virus was performed using RT-PCR, and positive samples were further analysed for subtype identification by multiplex RT-PCR.

Results

SwIAV was detected in 37 farms (74% prevalence). The following subtypes were identified: 1- H1avN1, 1- H1avNx, 10- H1avN2, 1- HxN2, 14- H3N2, 4- H1pdmN1. It was not possible to identify the circulating subtype in 8 farms, and 2 farms had simultaneously 2 circulating subtypes. No H1hu was detected.

Discussion and Conclusion

The high detection rate of swIAV confirms its endemic status in Portuguese pig production, highlighting the need for continuous monitoring and strategic control. The predominance of H1avN2, H3N2, and H1pdmN1 strains demonstrates ongoing viral evolution and coexistence of multiple antigenic lineages. Implementing age-group sampling effectively captured this diversity and identified critical infection windows. These findings underscore the importance of vaccines that protect against multiple subtypes to provide broader and more consistent immunity, supporting producers with effective solutions that address the complex and evolving swIAV landscape, ultimately enhancing herd health and productivity.

VVD-PP-54

HEPATITIS E VIRUS SURVEILLANCE STUDY IN NORTHERN IRELAND PIG HERDS AND OTHER ANIMAL RESERVOIRS

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Background and Objectives

Hepatitis E virus (HEV) is an emerging global pathogen and a causative agent of a viral hepatitis disease in humans. HEV genogroups 3 and 4 are emerging worldwide to cause sporadic zoonotic infections with domestic pigs recognised as the main reservoir. Zoonotic transmission occurs via the oral-faecal or food-borne routes of infection. People who work directly with pigs, consume raw or under cooked pork products and immunocomprised people are most at risk of HEV infection. Limited information exists on epidemiological surveillance studies especially when considering HEV animal reservoirs and transmission links from 'farm to fork.'

Material and Methods

We established the prevalence of HEV in NI pig population by testing HEV IgG antibody levels (n=448 sera) by ELISA and HEV RNA viral load by qPCR from a pig abattoir biobank of pig liver (n=700), sera and faeces (n=130 each) from ~20 farms. Additional biobanks included pig, mixed livestock and wildlife samples submitted for postmortem. A molecular epidemiological longitudinal study of six farms was conducted tracking 25 pigs per farm for 20-weeks at five time-points identifying HEV infection dynamics and viral shedding (n=750). Co-infections were detected, metadata collated and NGS de novo viral metagenomics approach taken for genotyping and phylogenetic analysis.

Results

The abattoir HEV serological positivity prevalence was 52.46% of pigs tested or 91% herd level. HeV RNA positivity levels in liver (1.14%), faeces (4.6%) and sera (2.3%) were low, or at herd level 15%, 25% and 29% respectively. Concerningly, positive pig samples indicated high viral loads. Other livestock tested positive whereas wildlife samples were negative. The longitudinal study detected HEV at each time-point demonstrating different infection dynamics and a reinfection occurrence.

Discussion and Conclusion

This study confirms HEV is prevalent in NI pig herds detecting virus at low levels at the abattoir sampling. Further studies on molecular subtyping of HEV is warranted to determine virus evolution.

VVD-PP-55

COMPARATIVE EVALUATION OF BIOCHECK AND INGEZIM ELISA KITS FOR PCV2 ANTIBODY DETECTION

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Background and Objectives

PCV2 antibodies can be elicited by natural infection, vaccination or obtained by transfer of maternally derived immunity. Serological assays are commonly used to monitor the humoral immune response upon infection, determine optimal vaccination timing and evaluate post-vaccination antibody induction. This study compared the performance of two of the most used ELISA commercial kits for PCV2 antibody detection in pigs.

Material and Methods

The tested serum samples (n=2174) come from 982 piglets sampled at 2 and 6 weeks of age [woa] from 20 commercial farms subjected to different PCV2 vaccination schemes, and from 30 piglets (vaccinated [V] and non-vaccinated [NV]) experimentally inoculated with PCV2 and sampled longitudinally at seven different points. Field data were analysed using non-parametric tests; correlation was assessed with Spearman's correlation coefficient and qualitative agreement with Cohen's kappa. Experimental data were analysed using parametric tests, namely repeated-measures ANOVA followed by Šidák's multiple comparisons test.

Results

The median (IR) S/P values obtained with BioCheck and Ingezim in all sera were 1.22 (0.641-2.09) and 0.312 (0.193-0.475), respectively. Overall, the correlation between kits was moderate ($r=0.567$; $p<0.001$), increasing when only samples from the experimental infection were considered ($r=0.766$; $p<0.001$). Qualitative interpretation indicated a fair level of agreement ($k=0.222$). Under field conditions, S/P values at 2-and 6-woa decreased ($p<0.001$) from 2.42 (1.53-3.01) to 1.17 (0.652-1.90) (BioCheck) and 0.455 (0.319-0.645) to 0.304 (0.198-0.472) (Ingezim). Under experimental conditions, only Ingezim showed seroconversion 3 weeks post-inoculation in NV pigs, while both ELISA kits detected immediate post-challenge booster response in V group.

Discussion and Conclusion

Both ELISA kits showed quantitative differences and a moderate correlation, which improved in samples from experimentally infected pigs, indicating better agreement under controlled conditions. Qualitative agreement between assays was fair, indicating partial overlap in immune status classification. Our results would suggest that, under the tested experimental conditions, Ingezim detected infection-associated seroconversion earlier than BioCheck.

VVD-PP-56

ASSESSMENT OF PORCINE CIRCOVIRUS 2 (PCV2) MATERNALLY DERIVED IMMUNITY AND EARLY INFECTION UNDER DIFFERENT VACCINATION STRATEGIES IN SPAIN

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Background and Objectives

PCV2 vaccination is mainly applied around weaning. Factors as maternally derived immunity and early infections may shape vaccine efficacy. This study described the antibody and infection status for PCV2 in piglets at 2 and 6 weeks of age [woa] in 77 commercial Spanish farms.

Material and Methods

Selected farms represented the geographical distribution of the Spanish pig production. Five piglets/sow from 10 sows with different parity were longitudinally bled at 2- and 6-woa (pre- and post-PCV2 vaccination). Vaccination protocol and weaning age were recorded. Sera were tested by ELISA (INgezim IgG) and qPCR. S/P values (IR) were compared across vaccination protocols and sow parities using non-parametric test.

Results

The "Gilt+piglet" (GP) protocol was the most used (52/77), followed by "Gilt+sow+piglet" (GSP) (14/77) and "Only piglet" (OP) (11/77). At 2 woa, GSP and GP showed higher S/P values (0.485[0.337-0.737] and 0.498[0.350-0.720], respectively) than OP group(0.363[0.209-0.523]; $p<0.001$). At 6 woa, GP had the highest value (0.315[0.201-0.475]) compared with the GSP (0.283[0.188-0.446]) and OP (0.255[0.173-0.416]) groups ($p<0.001$). At 2 woa, first parity sows showed higher S/P values (0.516[0.344-0.759]) than the 2-4 (0.474[0.337-0.683]; $p=0.006$) and >5 (0.454[0.315-0.693]; $p<0.001$) groups. This effect was not significant in the GSP protocol. PCV2 infection was mainly detected at 6-woa with qPCR positivity rates of 5/688 in GSP, 25/2551 in GP and 53/514 in OP groups. Viral load ranged from $1x10^4$-$4.85x10^9$ copies/mL of sera.

Discussion and Conclusion

Farms vaccinating sows and/or gilts had higher maternally derived antibody in piglets at 2 woa and a lower frequency of PCV2 genome-positive piglets at 6-woa, suggesting an association between higher passively acquired antibody levels and reduced early PCV2 detection. Under the GSP protocol, piglet immunity at 2 woa was not influenced by sow parity.

VVD-PP-57

CHANGES IN ADAPTATION OF GILTS PRIOR TO MATING INFLUENCES THE ENTERIC VIROME OF THEIR OFFSPRING

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Background and Objectives

The porcine enteric virome is the assemblage of eukaryotic viruses residing in the gastrointestinal tract of pigs. A disbalanced virome may be associated with wasting disease. This study aims to investigate the role of adaptation of gilts prior to mating in relation to the circulation of enteric viruses in their offspring at 2-10 weeks of age.

Material and Methods

A farm with post-weaning wasting syndrome, specifically in litters from gilts, was identified. A management change in adaptation of gilts prior to mating was applied. In the “new” strategy, gilts had direct contact with sows and recently introduced gilts in the insemination unit. Ten rectal swabs per age group (2, 3.5, 5, 7 and 10 weeks of age) were collected from piglets before and after the management change. Virome composition was determined by nanopore sequencing and virus-specific qPCRs for Rotavirus (RV) type A & C, Porcine Astrovirus (PAstV) 1-5, Porcine Kobuvirus (PKoV), Porcine Sapelovirus (PSV), Enterovirus G (EV-G) & Porcine Sapovirus (PSaV).

Results

Post-wasting syndrome wasn’t observed clinically after the management change. In piglets born from gilts in the “old” adaptation strategy, RVC was prominent before weaning. This contrasts sharply with the detection of RVA before weaning in piglets born from gilts in the “new” adaptation strategy. For PAstV1-5, PKoV, EV-G & PSaV no major differences were observed.

Discussion and Conclusion

The change in adaptation strategy of gilts prior to mating resulted in less clinical problems and appeared associated with an altered virome composition in their offspring, without detection of RVC before weaning. RVC wasn’t detected prior to weaning in a virome study on seven well-performing farms in the Netherlands, whereas RVA was found (Schyns et al., 2025). Both viruses are potentially pathogenic but circulate also in clinically healthy piglets. Although the observations may be influenced by sequential sampling, the reduced number of affected piglets may be associated with gilt adaptation.

VVD-PP-58

ENVIRONMENTAL PRRSV SURVEILLANCE IN SOW HERDS: AN INNOVATIVE MONITORING ALTERNATIVE.

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Background and Objectives

Due to the importance of understanding the dynamics of PRRS infection in sow herds, different diagnostic methods have been developed. Producers are interested in developing sampling methods that provide accurate information at a reasonable labor and economic cost The objective of this study was to determine whether surface sampling can be a reliable alternative method to existing ones, to monitor PRRSV infection dynamic on farms.

Material and Methods

The study was conducted between June 2025 and November 2025 on 2,200 sows herd. An outbreak of PRRSV occurred two months earlier.Eight surface samples using cotton swabs were taken monthly in the farrowing room: 4 mat samples, 2 fan samples, 1 clothes' worker, 1 boot 'worker, 1 processing trolley, and 1 swab taken by rubbing the syringe needle. Simultaneously, 15 serum samples were taken (3 pools) and 2 weekly tongue pools, expanding to 7 tongue pools from September.All the samples were individually tested using VetMAX PRRS EU/NA 3.0 kit (Termofisher)

Results

In June, all serum and tongue samples were positive, as were all environmental samples except for the syringe.In August, tongue samples were positive with higher ct values, and all environmental samples except for one extractor, the processing trolley, and the syringe were positive. In September, all serum samples and 2 of 7 tongue samples were negative, and only 2 samples from the farrowing pen and the employee's boots were positive.In October, all serum and tongue samples were negative, and only 3 mats were positive. From November onwards, all samples were negative.

Discussion and Conclusion

Under the condictions of this study the performance of surface samples was similar to that of serum and tongue samples. The ease of sampling and the absence of impact on animal welfare suggest that environmental surveillance could have potential as a tool for studying the dynamics of PRRSV infection.

VVD-PP-59

A NOVEL METHOD OF AEROSOL CAPTURE USED TO DETECT PORCINE REPRODUCTIVE AND RESPIRATORY SYNDROME VIRUS 1 IN ANIMAL HOUSING

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Background and Objectives

Porcine reproductive and respiratory syndrome virus (PRRSV) causes disease with a significant economic impact for the pig industry. PRRSV transmission via direct contact has been well described. However, there is increasing evidence to support possible airborne PRRSV-1 transmission, particularly over longer distances. Recent case studies have attributed novel PRRSV-1 outbreaks to transmission via aerosols without direct evidence for this or any other methods. Therefore, there remains a research gap whereby PRRSV-1 transmission via aerosols can be directly determined.

Material and Methods

To determine if PRRSV-1 is detectable in the air, an aerosol capture device was used to take samples in pig housing. These devices use a rotating motor with attachments that have a sticky surface in order to collect aerosol particles as the device spins. Devices were mounted in pig housing and samples taken daily during the first week following experimental PRRSV-1 infection. Once sampling was complete, these attachments were washed and homogenised prior to RNA extraction. PRRSV presence was then evaluated via RT-PCR.

Results

Proof of concept work was done to determine if PRRSV-1 can be detected from the device attachments. Artificial exposure of attachments in vitro confirmed it is possible to detect PRRSV-1 by PCR in this system with a sensitivity of up to 25 virus particles. Preliminary data from in vivo studies showed PRRSV-1 detectable by RT-PCR on all days in the first week post infection with mean Ct values between 31-36.

Discussion and Conclusion

Use of this novel aerosol capture device provides insight into a likely transmission route of PRRSV-1. Placing these devices in animal housing enabled successful detection of PRRSV-1, and these results suggest a promising new aerosol capture technique to be further evaluated in the field. Future studies based on these results may impact future biosecurity practices in British pig farms.

VVD-PP-60

SWINE INFLUENZA VIRUS LINEAGES DIVERSITY AND PREVALENCE IN SPANISH SWINE HERDS

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Background and Objectives

Swine Influenza A Virus (swIAV) is a major respiratory pathogen in pig production, with increasing genetic complexity due to reassortment and interspecies transmission. This evolution has led to a shift from traditional subtype classification (e.g., H1N1, H3N2) to lineage-based characterization, which more accurately reflects the genetic origin (human, avian, swine) and antigenic properties of circulating strains. This study aims to analyze the prevalence and distribution of swIAV hemagglutinin (HA) lineages in Spanish swine herds.

Material and Methods

A total of 213 samples were collected from 200 IAV-positive swine farms across Spain between 2024 and 2025, including both clinically affected and subclinical herds. On each farm, either individual nasal swabs from suckling piglets or oral fluid samples from weaned and nursery piglets (50 animals per rope, representing approximately 200 animals per farm) were submitted to Diagnos Amer (HIPRA) for HA lineage characterization. Only samples with high viral loads were selected, as confirmed by real-time RT-PCR targeting IAV, with an average Ct value of 24.5. HA lineage identification was performed using PCR and sequencing when required, enabling differentiation among the main circulating lineages: H1av (avian-like), H1hu (human-like), H1pdm (pandemic 2009), and H3 (human-origin).

Results

Among the characterized samples, H1av was the most prevalent lineage, representing 37% of the total. H3 was the second most common, detected in 33% of samples. H1pdm accounted for 25%, while H1hu was the least represented, with only 5% prevalence.

Discussion and Conclusion

These findings highlight the dominance of avian-origin H1 strains in Spanish swine herds. The substantial presence of H3 and H1pdm lineages further reflects the complex viral landscape shaped by ongoing reassortment and interspecies transmission. These findings underscore the importance of lineage-based surveillance to detect shifts in viral dynamics, supporting improved control measures, in swine production systems facing evolving viral pressures.

VVD-PP-61

IMMUNIZATION STRATEGIES FOR PRRS IN SWINE: MAPPING THE EVIDENCE IN NORTH AMERICA

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Background and Objectives

Vaccination remains a key strategy for controlling Porcine Reproductive and Respiratory Syndrome (PRRSV). In addition, producersin the Unites States (US) sometimes rely on alternatives such as live-virus inoculation (LVI) to promote herd immunity. However, strategie's comparative performance and practical field implications remains limited. This scoping review aims to synthesize the current literature on immunization strategies in controlling PRRSV, focusing on clinical, reproductive, virological, immunological, and productivity outcomes in swine populations from North America.

Material and Methods

The review followed the PRISMA-ScR framework. Search was conducted in MEDLINE, CABI: CAB Abstracts® and Global Health®, BIOSIS Citation Index, and Agricola. In vitro studies, modeling or simulation studies were excluded.

Results

Of the 1,954 studies initially identified, 1,046 duplicates were removed and 942 records were screened. After assessing 378 full-text articles, 48 studies met the inclusion criteria, evaluating commercial PRRS vaccines or field exposure strategies in North American swine from 1996 to 2024. The studies were located in the Unites States (87.24%), Canada (8.51%), and Mexico (2.13%). Nearly 80% of the studies assessed the use of modified live-virus (MLV) vaccines, primarily Ingelvac PRRS® MLV. Approximately 5% evaluated killed vaccines, while around 15% examined serum inoculation or exposure to field strains. Preliminary results suggest commercial vaccines were commonly associated with reductions in clinical signs and viremia, improved growth and reproductive performance, and minimal adverse effects. Around 70% of the studies assessed vaccine performance, using a wide range of PRRSV strains, including the PRRSV MN-184 isolate.

Discussion and Conclusion

Heterogeneity across studies, including the diverse PRRSV isolates used in challenge and the variability in reported outcomes, highlights the difficulty of assessing immunization efficacy. Evidence on alternative approaches such as serum inoculation remains limited. Overall, the literature indicates a continued reliance on MLV vaccines but reveals clear gaps in comparative evidence and standardized outcome reporting.

VVD-PP-62

COMPARISON OF IDEXX REALPCR PRRSV-1/PRRSV-2 MULTIPLEX RNA TEST WITH AN IN-HOUSE METHOD TO DETECT PRRSV-1 AND PRRSV-2 IN CHARACTERIZED POSITIVE SAMPLES FROM DENMARK

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Background and Objectives

Reliable diagnostic tools are critical in diagnostic of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV). This study compared an in-house real-time RT-PCR method (IHM) to a recently launched commercial method, IDEXX RealPCR PRRSV-1/PRRSV-2 Multiplex RNA test (CM).

Material and Methods

In total, 21 previously sequenced PRRSV-1 and PRRSV-2 positive samples of various matrices including serum, processing fluids, lung tissue, and slurry were tested in parallel in IHM and CM. Additionally, ten-fold dilution series of two serum samples positive for PRRSV-1 or PPRSV-2, were performed to evaluate the analytical sensitivity.

Results

Qualitatively, there was a perfect agreement between the methods. Quantitatively, cycle threshold (Ct) values of IHM were consistently later than CM across all sample pairs (Wilcoxon signed-rank test). For PRRSV-1, the statistically significant median difference was 4.85 Ct-values ($p<0.001$), whereas for PRRSV-2, the statistically significant median difference was 4.51 Ct-values ($p<0.01$). The efficiency of the IHM and CM were comparable for both PRRSV-1 and PRRSV-2, but for PRRSV-1 CM detected a dilution of 10^6, where IHM only detected a dilution of 10^5.

Discussion and Conclusion

The CM detected all samples with a lower Ct value and had a longer dynamic range for PRRSV-1 indicating higher amplification efficiency and higher analytical sensitivity. Furthermore, CM contains an RNA host-based endogenous control to quality control for PRRSV RNA integrity, which can reveal if the RNA has been degraded during transportation to the laboratory.

VVD-PP-63

ZOONOTIC RISK OF SWINE INFLUENZA VIRUS IN SERBIAN SMALL-SCALE PIG FARMS: IMPLICATIONS OF LOW BIOSECURITY AND MULTISPECIES CONTACT

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Background and Objectives

Swine influenza is contagious disease affecting pigs, caused by swine influenza A viruses (swIAV). Despite the recognised zoonotic risk of swIAV, there is no harmonized European surveillance for swIAV in pig herds**.** Serbia, a country located in the Western Balkan, has a highly diverse pig production sector with no influenza national surveillance influenza programme. The pig sector includes intensive and extensive holdings (small-scale) farms. However, health control and biosecurity measures prescribed by legislation mainly apply to industrial holdings. The aim of the study was to assess the biosecurity of small-scale farms with regard to the pig - other domestic species interface. Additionally, serological testing of breeding pigs from selected small-scale farms with low biosecurity was conducted.

Material and Methods

Data were collected using an epidemiological questionnaire design to capture the biosecurity measures on 95 small-scale farms. Additionally, 76 serum samples obtained from breeding animals were tested in order to detect the presence of influenza antibodies (ID Screen® Influenza A Antibody Competition Multi-species ELISA kit, Innovative Diagnostics - IDVet, France).

Results

On most of farms, cohabitation of pigs with poultry and ruminants was observed. Specifically, on 52.6% farms, pigs have direct interaction with various poultry species, including sharing indoor space. Animals often had access to outdoor areas, allowing potential direct contact with wild birds. The swIAV antibodies were detected in 21 sera samples from five different farms. Examined farmers were completely unaware of the zoonotic risk posed by swIAV.

Discussion and Conclusion

The main challenge for small-scale pig farming is the lack of basic biosecurity measures, which may facilitate the spread of swIAV. Currently, swIAV control in the pig sector remains largery neglected. Cohabitation of pigs with other animal species, as well as human-animal interface poses a high risk for swIAV transmission. This abstract is based upon work from COST Action ESFLU CA21132, supported by COST.

VVD-PP-64

SEROLOGICAL SURVEY FOR SWINE INFLUENZA VIRUS (SIV) IN FARMS IN JALISCO, MEXICO.

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Background and Objectives

In Mexico, the seroprevalence of SIV has been identified using reference strains or strains obtained from the field, with a general approach. The objective of this research was to conduct a serological survey using IPV strains isolated in the central-western region of Mexico.

Material and Methods

As part of the epidemiological surveillance program in the State of Jalisco (with support from the state epidemiological surveillance group), blood samples were taken from farms without active respiratory illnesses (years 2022-2024). A total of 2,209 serum samples were collected from 101 farms in the state. The serum samples were analyzed by hemagglutination inhibition (HI) using a standardized protocol for the H1N1 (Jalisco/2013), H1N2 (Guanajuato/2014), H3N2 (Jalisco/2013), and H3N2 JAL (Jalisco/2022) subtypes.

Results

A total of 8,836 tests were performed, detecting 100% seropositivity in the farms analyzed. The frequency for the H1N1 subtype was 39.5%, for H1N2 84.1%, for H3N2/2013 42%, and for H3N2/2022 63.7%. Different presentation values were identified according to the antibody titer.

Discussion and Conclusion

In 2014, in Jalisco, 35.2% seropositivity was identified in 12 municipalities, indicating an increase of more than 100% over a 10-year period for the H1N2 subtype. Different presentation values were identified according to antibody titer. Serological analyses allowed for the identification of antibody titer distribution, highlighting the variation in presentation using a recently isolated strain (H3N2) compared to an older strain. The information generated will support ongoing projects aimed at developing diagnostic tests and biologics adapted to regional needs, in this case, the state of Jalisco. Funded by INIFAP Fiscal Resources SIGI 7285536076.

VVD-PP-65

GENOMIC DELETION AND COMPLETE ATTENUATION OF THE ASFV PAJU STRAIN FOLLOWING ADAPTATION TO CELL LINES (K-C4 AND LFBK): A SAFETY EVALUATION OF HIGH-PASSAGE VACCINE CANDIDATES

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Background and Objectives

African Swine Fever (ASF) lacks a fully licensed, scalable vaccine due to reliance on primary cells. This study aimed to develop a Live Attenuated Vaccine (LAV) candidate using the virulent Korean ASFV Paju strain adapted to continuous cell lines.

Material and Methods

The virus was serially passaged 30 times in K-C4 and LFBK cell lines, confirmed by titers exceeding 10^8 genome copies/mL. To evaluate safety, pigs (n=2–3/group) were inoculated intramuscularly with viruses from the 17th, 25th, and 30th passages (doses: 10^4.5–10^6.5 HAD_{50} (or $FAID_{50}$)/mL). Clinical signs and viremia were monitored for 28 days, utilizing qPCR and Next-Generation Sequencing (NGS) for analysis.

Results

A clear phenotypic divergence was observed. Pigs inoculated with the 17th passage virus exhibited severe pyrexia and mortality by 8 days post-vaccination. In contrast, the 25th and 30th passage groups survived the 28-day study period, remaining clinically normal with no detectable viremia in blood or swabs. NGS revealed specific deletions in Multi-Gene Family (MGF) regions and EP153R/EP402R genes in the high-passage strains, correlating with attenuation.

Discussion and Conclusion

The ASFV Paju strain exhibits an attenuated clinical phenotype after 25 serial passages in continuous cell lines. These strains represent promising vaccine candidates, though further evaluation of genomic stability and immunogenicity is required to confirm safety.

VVD-PP-66

FIELD EVALUATION OF PEDQ® EMERGENCY VACCINATION PROTOCOL IN A PEDV-OUTBREAK PIG FARM IN TAIWAN.

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Background and Objectives

Porcine epidemic diarrhea virus (PEDV) poses a severe economic threat, with mortality rates reaching 100% in neonatal piglets. In Taiwan, despite the availability of the PEDQ® subunit vaccine, its field efficacy remains insufficiently documented while PEDV continues to be endemic. This study evaluates the effectiveness of an emergency vaccination protocol implemented on a 1,400-sow farm during the early stages of an outbreak.

Material and Methods

The study was conducted in four distinct phases: initial sampling, primary vaccination, booster administration, and final sampling. Initial sampling was performed at the onset of clinical signs. One week following the initial sampling, all the sows during the 14–60 days pre-farrowing received their primary vaccination, followed by a booster two weeks thereafter. The final sampling was completed one month after the initial vaccination. Both sampling events involved 10 rectal swabs from randomly selected piglets exhibiting acute watery diarrhea and 18 environmental swabs. Environmental sites included creep box walls, floors, syringe, personnel's hands, feed equipment, carts, scoops, door handles and nipple drinkers. All swabs were analyzed for PEDV viral load using quantitative PCR (qPCR). Besides, diarrhea rates and mortality of 5- and 10-day-old piglets were also collected.

Results

Swab positivity fell significantly from 71.1% to 14.2% ($p < 0.05$). Mean viral loads decreased from 4.4×10^{6} to 1.5×10^{3} copies/㎕ ($p = 0.64$). Diarrhea rates dropped significantly in 5-day-old (21.2% to 15.8%, $p<0.05$) and 10-day-old (17.3% to 12.3%, $p<0.05$) piglets. Furthermore, cumulative mortality exhibited a significantly decline, falling from 11.8% to 5.9% in the 5-day-old group and from 30.8% to 6.9% in the 10-day-old group ($p < 0.05$)

Discussion and Conclusion

These results demonstrate that emergency vaccination administered at the onset of an outbreak markedly mitigates viral transmission and clinical severity, while significantly enhancing piglet survival rates during acute episodes.

VVD-PP-67

PRRSV: VACCINE STRAIN OR FIELD VIRUS? NEW PCR-BASED DIVA SOLUTION SAVES TIME AND MONEY

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Background and Objectives

Porcine Reproductive and Respiratory Syndrome Virus causes enormous economic losses worldwide due to respiratory problems in pigs of all ages and reproductive failure in sows. While vaccination plays a key role in control, the ability to differentiate PRRSV vaccine strains from wild-type strains is crucial for outbreak investigations and effective monitoring of vaccination programs. The virotype® PRRSV EU Vax RT-PCR Kit from INDICAL BIOSCIENCE is the first real-time RT-PCR test that identifies all major commercially used PRRSV-1 (EU) live-attenuated vaccines in one run, delivering results in just 67 minutes.

Material and Methods

The virotype® PRRSV EU Vax RT-PCR Kit includes two ready-to-use multiplex RT-PCR Master Mixes containing primer/probes specific to the main PRRSV-1 vaccines. In combination with the PRRSV-1 screening kits, it enables a PCR-based DIVA workflow for rapid differentiation of vaccinated and infected animals. Both assays can also be run in one PCR cycling program. Extensive validation was conducted in several laboratories comparing PCR results to established sequencing methods and vaccines applied. Performance was assessed based on agreement with sequencing results and known vaccination status.

Results

The assay showed high concordance with sequencing, as well as excellent sensitivity and specificity.
Vaccine identification by PCR was possible even in samples where sequencing could not be performed or interpreted.

Discussion and Conclusion

Current methods for vaccine identification in PRRSV-1 positive samples are costly and time-consuming. We have developed a PRRSV RT-PCR kit which enables rapid and cost-effective identification of all major PRRSV-1 vaccines in a single run with high sensitivity. Furthermore, this kit enables reliable detection and differentiation of vaccines even in weak samples, where sequencing reaches its limits or fails due to poor sample quality or other factors.

VVD-PP-68

COMPARISON OF TWO DIFFERENT SOW VACCINATION PROTOCOLS IN THE AIM OF REDUCING SWINE INFLUENZA VIRUS SHEDDING ON SUCKLING AND WEANING PIGLETS

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Background and Objectives

In this study, we investigated the efficacy of different sow booster vaccination protocols by measurement of seroconversion profiles and piglets' shedding of swine influenza virus (SIV).

Material and Methods

Before the trial, in a 600-sows farrow to finish herd located in Brittany, regular H1avN2 SIV episodes in suckling and weaned piglets were observed despite sows mass vaccination (every 3 months) with RESPIPORC® FLU 3 (vaccine A) and RESPIPORC® FLUpan. Eighteen sows were randomly allocated to three groups (n=6) and vaccinated twice before farrowing with vaccine A, GRIPORK® (B) or PBS (C). Serum samples were collected from sows before and after vaccination and some of their piglets from 1 to 9 weeks of age (woa). Antibody titres were measured by ELISA and HI (H1avN1, H1huN2, and H3N2) and compared using a linear mixed model. Piglets' shedding was assessed weekly, using nasal swab (NS) and oral fluid (OF) between 1–9 woa on 5 piglets per litter (NS) and one OF per litter and post-weaning pen. Sows udder wipes (UW) were performed at 1 and 3 weeks post-farrowing. NS were analysed pooled by 5 and UW and OF individually by RT-PCR and, in case of positivity, the influenza subtype was determined. Results were compared using Kruskal–Wallis test and Dunn post-hoc test.

Results

ELISA titres of group B, in sows and piglets, were statistically higher than those of the other groups at all sampling time post-vaccination. The same was observed by HI in group B, with significantly higher titres (H1avN1 and H3N2).Piglets in group B showed a significantly lower percentage of positive NS at 3 woa. Numerically, there was also fewer positive NS, UW and OF at most sampling points.

Discussion and Conclusion

In the condition of our study, in sows previously vaccinated with other vaccines, pre-farrowing vaccination with GRIPORK® induced an improved antibody response and a greater reduction of H1avN2 piglets' shedding.

VVD-PP-69

PREVALENCE OF PORCINE CIRCOVIRUS GENOTYPES ON COMMERCIAL FARMS IN MEXICO

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Background and Objectives

The global evolution of PCV2 genotypes reflects the virus's high capacity to mutate and generate new variants. This genetic plasticity supports the emergence and spread of different genotypes over time, influencing epidemiology, virulence, and vaccine performance. Understanding this dynamic is essential for effective control and prevention strategies. The objective of this study was to estimate the occurrence of different genotypes on Mexican farms.

Material and Methods

During the year 2025, 22 farms located in Central, Western, and Southern Mexico were sampled; region that accounts for approximately 70% of Mexico's production. The farms were randomly selected in these regions. The serum samples (from piglets aged between 1 and 23 weeks) investigated were those that tested positive by PCR, with a "CT" below 25, during epidemiological investigation of farms for PCV2. 203 serum samples were pooled in groups of 5, with 1015 piglets sampled. DNA was extracted by the IndiMag Pathogen Kit (Indical Bioscience) and subjected to the PCV2 genotyping assay by the Kylt® PCV-2 Typing Kit (AniCon Labor GmbH) to differentiate between PCV2 genotypes.

Results

The results of the 203 samples analyzed, 72 were positive for PCV2 by PCR. 52 samples were typification and 62% of them were PCV2d, 36% were PCV2a, and 2% were PCV2a+d. And the results from the 22 farms sampled, 14 farms (63%) were positive for PCV2 PCR: 4 of those farms (28.5%) were positive for PCV2a, 6 farms (43%) for PCV2d, 4 farms (28.5%) for PCV2a+d.

Discussion and Conclusion

The data of this study reinforce that PCV2d remains the most prevalent genotype in the swine populations analyzed. This predominance is consistent with recent research from Mexico and other countries which also reported high detection rates of this genotype. Together, these data highlight the ongoing evolution of PCV2 and the need for continuous genetic monitoring to guide effective control strategies.

VVD-PP-70

INACTIVATION OF AVIAN INFLUENZA VIRUS DURING MANUFACTURING PROCESS OF BOVINE SPRAY-DRIED PLASMA AND HEMOGLOBIN

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Background and Objectives

Avian influenza virus (AIV) represents a significant risk for livestock, as it can infect birds and potentially evolve to affect other species such as ruminants and humans. This study assessed the inactivation of low-pathogenicity AIV H1N1 in spray-dried bovine plasma (SDBP) and spray-dried bovine hemoglobin (SDBRC) after spray-drying and storage at room temperature. Bovine materials were selected to avoid interference from porcine influenza virus antibodies.

Material and Methods

A low-pathogenicity H1N1 strain was amplified in embryonated chicken eggs to obtain a high-titer inoculum. Commercial SDBP and SDBRC were ©-irradiated and reconstituted at 25% solids. Three 900 g batches were inoculated with 100 g of virus before spray-drying. Samples were processed in a Büchi 290 dryer under standardized inlet (200±5°C) and outlet (80±1°C) temperatures. Dried inoculated material was subdivided into 0.5 g aliquots and heated at 90 ± 3°C for 60 s to simulate commercial treatment. Three aliquots per batch were stored at 22–25°C for 14 days before titration. Viral infectivity was evaluated in embryonated eggs using undiluted samples and 10-fold serial dilutions (10E0–10E-7). Five eggs per dilution were inoculated and monitored for 7 days. Viral reduction (LogR) was calculated by comparing initial inoculum titers with titers obtained after spray-drying and storage.

Results

Initial untreated controls contained 10E6–10E7 TCID50/mL In SDBP, spray-drying reduced virus levels by 3.90–4.40 logs, with reductions reaching 4.76–5.20 logs after 14 days at room temperature. In SDBRC, spray-drying produced 2.07–2.40 log reductions, increasing to 3.41–4.45 logs after storage.

Discussion and Conclusion

Spray-drying combined with 14-day storage at room temperature effectively inactivated AIV, achieving >5 log10 reductions in plasma and nearly 4 log10 reductions in hemoglobin supporting the safety of spray-dried bovine plasma and hemoglobin for use in animal feed.

VVD-PP-71

REASSORTENTS OF SWINE INFLUENZA A VIRUS (SWIAV) CONTAINING BOTH PANDEMIC AND AVIAN/SWINE HA AND NA IN DANISH HERDS IN 2024.

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Background and Objectives

As a supplement to management, sow vaccination is important to control swIAV. Two vaccines by Ceva Aminal Health, France are registered in Denmark to cover pandemic (Respiporc FLUpan; H1pdmN1pdm) or avian, human or swine swIAV (Respiporc FLU3; H1avN1av, H1huN2sw and H3huN2sw). This investigation aims to evaluate the occurrence of reassortent swIAVs containing both pandemic and avian/swine HA and NA to explore the potential need for the two vaccines in combination.

Material and Methods

Screening of Danish herds for swIAV was performed by pig veterinarians in 2024. Samplings were performed in herds with unsatisfactory production results, clinical signs of Influenza or to validate if the applied influenza vaccine matched the currently circulating swIAV strains. In total, 229 herds were included in the screening, that was performed via five nasal swabs pools, each with nasal swabs from five pigs, (three pools from piglets and two pools from newly weaned pigs). The pooled nasal swabs were subtyped at the Statens Serum Institute in Copenhagen, Denmark, using multiplex RT-PCR and Next Generation Sequencing on the individual pools.

Results

SwIAV was detected in 70.3% (161/229) of the herds. Of these, 30.4% (49/161) had a reassortent subtype including HA and NA of both pandemic and avian/swine origin. The reassortents included H1avN1pdm (n=2), H1pdmN1av (n=38) and H1pdmN2sw (n=9).

Discussion and Conclusion

The prevalence of reassortants of both pandemic and avian/swine HA and NA subtypes was 30,4%, excluding pools where several HA and NA genes were detected indicating circulation of several subtypes and not reassortants. If both HA and NA are important for the immune response, this imply that these herds, potentially have a benefit of using both vaccines.

VVD-PP-72

RECENT PREVALENCE AND DISTRIBUTION OF PCV2 GENOTYPES IN SEVERAL EUROPEAN COUNTRIES

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Background and Objectives

Porcine circovirus type 2 (PCV2) remains one of the most economically relevant pathogens in global swine production. Although several genotypes (PCV2a, PCV2b, PCV2d, and combinations thereof) circulate worldwide, their regional dynamics continue to evolve, requiring continuous monitoring. This study aimed to characterize the current prevalence of PCV2 genotypes in selected European countries—Belgium/Netherlands, Czech Republic, Denmark, Hungary, Poland and Spain—using recently collected diagnostic samples.

Material and Methods

A total of 225 field samples that tested PCR-positive for PCV2 between 2022 and 2024 (predominantly collected in 2024) were analyzed. Samples originated from routine submissions to veterinary diagnostic laboratories and from additional farm-level collections, depending on local availability. Sample selection was opportunistic and not based on a predefined epidemiological design.Genotyping was performed by Sanger sequencing of the ORF2 region or by genotype-specific PCR, depending on laboratory workflow and sample quality. Genotype occurrence was assessed descriptively, and mixed-genotype detections (PCV2a/PCV2b or PCV2b/PCV2d) were recorded when more than one genotype was identified in a single sample.

Results

PCV2d was the predominant genotype across all six countries, detected in 59.3–100% of samples, confirming its dominant position in Europe. PCV2a was identified in 1.7–18.8% of samples, while PCV2b was present in 1.7–38.5%. Mixed infections were also observed: PCV2a/PCV2b co-detections accounted for 20.4% of positive samples, whereas PCV2b/PCV2d combinations occurred at 1.9–3.4%. Although genotype presence varied between countries, the overall pattern consistently reflected a strong predominance of PCV2d with lower, variable circulation of PCV2a and PCV2b.

Discussion and Conclusion

Within the limitations of non-standardized, opportunistic sampling, PCV2d was the most frequently detected genotype in recent PCV2-positive samples, while PCV2a and PCV2b occurred at lower and variable frequencies. Mixed-genotype detections indicate ongoing viral diversity. These results represent a snapshot based on diagnostic material rather than a comprehensive epidemiological assessment, but they support the value of continuous surveillance to monitor PCV2 genotype dynamics over time.

VVD-PP-73

IMPACT OF PORCINE EPIDEMIC DIARRHOEA VIRUS (PEDV) ON PRODUCTIVE PERFORMANCE PARAMETERS IN FINISHING PIGS.

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Background and Objectives

Enteric disorders constrain pig production by reducing growth and increasing losses through poorer average daily weight gain (ADWG), feed conversion ratio (FCR) and mortality. Porcine epidemic diarrhoea virus (PEDV) affects pigs of all ages; during finishing, when output is maximal, performance losses translate into reduced profitability. This study assessed the association between PEDV status and final body weight, ADWG, FCR and mortality in finishing pigs.

Material and Methods

Two finishing farms in the same area and under the same integrator were selected based on PEDV status, determined by RT-qPCR on rectal swabs (faecal material) collected at entry and before slaughter. Farm A was PEDV+ and showed clinical signs, whereas Farm B (PEDV-) remained negative throughout study. 2,038 pigs were weighed at entry and before slaughter to calculate ADWG. Mortality was recorded, and FCR was obtained at farm level. Normality was assessed using Shapiro-Wilk; means were compared using a t-test ($p<0.05$). Mean differences are reported with 95% confidence intervals (CI).

Results

Pigs from Farm A (PEDV+) had a lower final body weight (98.98±9.27 kg) than pigs from Farm B (PEDV-) (102.55±7.01 kg) ($p<0.05$; 95% CI: 2.86-4.28). ADWG was lower in Farm A (0.730±0.180 kg/day) than in Farm B (0.748±0.100 kg/day) ($p<0.05$; 95% CI: 0.01-0.03). Mortality was 3.02% in Farm A and 2.48% in Farm B ($p>0.1$; 95% CI: -0.88 to 1.96). Farm-level FCR was 2.533 in Farm A and 2.481 in Farm B.

Discussion and Conclusion

PEDV positivity was associated with reduced performance during finishing, mainly lower final body weight and ADWG. Although feeding practices, environmental conditions and health status regarding other pathogens were similar in both monitored farms, one of the limitations of this study is that it was conducted in only two finishing farms. Therefore, further studies are needed to provide stronger evidence of the impact of PEDV on growth performance.

VVD-PP-74

IDENTIFICATION OF PCV2 IN SLAUGHTER LUNGS, PCV2D DOMINATING IN DENMARK

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Background and Objectives

Post-mortem lung scoring is an easy tool to monitor the level of respiratory health at the farm level. Ceva Lung Program (CLP) is a valuable tool to establish the prevalences and severity of respiratory diseases caused by e.g. Enzootic Pneumonia (EP) and Actinobacillus pleuropneumonia (AP). Infection with porcine circovirus type 2 (PCV2) may also impact the severity of respiratory disease but cannot be assessed by visual examination of the lungs. The aim of this study was to extend the analyses performed in the CLP program with analyses of PCV2 levels in a lung swab. In addition, the genotype of the positive PCV2 samples were determined by sequencing.

Material and Methods

Most of the CLP's performed in Denmark, are performed during LUNGVEMBER, a campaign with focus on lung health every year in November, where the herds are designated by the herd veterinarian. 30 lungs were collected from each participating herds at slaughter and thereafter macroscopic evaluated and scored using the CLP method. From 30 randomly selected herds, 5 lung swabs were collected from each herd, by swabbing the main bronchi in the diaphragmatic lobe. The samples were tested for PCV2 by quantitative qPCR and genotyped using SANGER sequencing.

Results

A total of 20 of the 30 herds tested positive for PCV2 by qPCR. The genotype was determined for nine herds. Of these, one herd had PCV2b and eight had PCV2d.

Discussion and Conclusion

Detection, quantification and genotyping of PCV2 in lung swabs from lungs included in the CLP program proved to be a good tool to provide information on the PCV2 load in the herds. Genotyping can subsequently be used as a basis for selection of matching vaccines. The majority of the PCV2 identified belong to PCV2d, which further support that this genotype is the most prevalent genotype, also in Denmark.

VVD-PP-76

PRODUCTIVITY IN GROWING PIGS IS NEGATIVELY AFFECTED BY POSITIVE PRRS SEROLOGICAL STATUS

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Background and Objectives

The ongoing national strategy to reduce PRRS (Porcine Reproductive and Respiratory Syndrome) in Denmark aims at improving the economic outcomes for pig producers. While acute outbreaks of PRRS are known to negatively impact productivity, there are few studies on effects in chronically infected herds. This study investigates the relationship between PRRS health status and productivity in Danish pig herds, with emphasis on growing pigs.

Material and Methods

Data from the national productivity average for Danish pig production in 2024 were combined with PRRS serological status data. The dataset included 103 sow herds, 52 weaner herds, and 245 finisher herds with unchanged PRRS serological status throughout 2024. Statistical analyses were done using linear models adjusted for herd size, with data management and statistics performed in R.

Results

The study found a statistically significant reduction in daily weight gain of approximately 40 g/day (3.7%) in finisher pigs (between 30 and 115 kg live weight), as well as 2.7% increase in feed conversion ratio from herds with positive PRRS serological status as compared to herds with negative PRRS serological status. The difference in mortality was not found statistically significant. For weaner herds, similar trends of reduced productivity were noted, though not statistically significant, likely due to smaller sample sizes and more variation in data. No significant differences in productivity were observed for sow herds.

Discussion and Conclusion

The findings show that pig herds being chronically infected with PRRS virus have a reduced productivity in growing pigs, particularly in finisher pigs (>30 kg). The reduction in daily weight gain and increase in feed conversion highlights the economic impact of PRRS on pig production. Further research is needed to explore the underlying mechanisms and potential mitigation strategies, but the results underscore the importance of controlling PRRS to improve productivity and economic sustainability of pig herds.

WEL-PP-01

TO SIP OR TO SPILL? BEHAVIOUR OF FATTENING PIGS USING A SELF-SERVICE DRINKER

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Background and Objectives

Pigs are highly exploratory, yet farm environments often provide little stimulation and overlook their cognitive needs. This study investigated whether pigs would expend effort to obtain water from a self-service trough despite simultaneous access to free, unrestricted water.

Material and Methods

The study took place in a structured, commercial fattening pen (35 pigs; one batch) in Lower Saxony, Germany. The pen contained two self-service drinkers (button-activated; water delivered to a floor-level bowl, each activation time-stamped) and four elevated trough drinkers. Video analysis (continuous recording of behaviour biweekly on five days between 09-12 AM and 04-07 PM) quantified drinking frequency and visit duration at all six drinkers and noted whether pigs drank after activating the self-service unit and whether they re-triggered it.

Results

The two self-service drinkers averaged 290.2 and 93.1 activations per day, respectively. Usage showed a bimodal circadian pattern with an afternoon peak. Over the observation period, commercial troughs received on average 314 visits versus 163 to the self-service units. In 77.2% (n = 159) of activations, pigs drank after triggering the self-service drinker. Average drinking time was 14 seconds at commercial troughs and 8 seconds at self-service drinkers.

Discussion and Conclusion

Pigs willingly performed an operant response to access water, even when free, effortless water was simultaneously available. Most activations led directly to drinking at the self-service trough, ruling out nonspecific exploratory or play behavior as the primary driver. Circadian use of the self-service units mirrored pigs' normal water intake patterns. The strong uptake of the self-service drinker may have been promoted by the floor-level water access, which resembles the pigs' natural drinking behaviour.

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WEL-PP-02

A COMPUTER VISION PIPELINE FOR ACTIVITY AND BEHAVIOUR MONITORING

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Background and Objectives

Social stressors such as regrouping influence pig behaviour, welfare and productivity. Advances in computer vision now allow continuous, non-invasive monitoring of behavioural patterns. The modular M3-PIG system detects, identifies and tracks pigs, enabling quantification of activity and key behaviours using posture and anatomical key points. These outputs further support the classification of pig-pig interactions, including agonistic events.

Material and Methods

Two experiments investigated behavioural changes around commercially realistic mixing events.
In Experiment 1, pigs were housed in groups of twelve across six pens and monitored before and after exchanging three of the largest animals among pens, triggering the establishment of a new dominance hierarchy.
In Experiment 2, pigs were regrouped upon movement to four fattening pens and monitored for 120 days. Each of the four fattening pens was filled by combining five pigs from three nursery pens each.
Video data were down-sampled to ensure comparable dataset sizes across pens. From the M3-PIG outputs, travelled distance per pig (pixel-based), proportion of standing pigs, and the number of agonistic interactions were quantified.

Results

In Experiment 1, travelled distance varied between pens due to differences in camera placement rather than behavioural differences. A small reduction in standing posture was observed after mixing.
In Experiment 2, travelled distance and standing posture did not differ markedly among pens but showed a steep decline immediately after regrouping, followed by a gradual decrease as pigs matured.
Both experiments revealed clear variation in agonistic interactions around mixing. A consistent pattern emerged: interactions dropped on the day after mixing and increased the following day. This highlights the need for more detailed assessment of detected interactions, particularly regarding valence and intensity, to better understand social dynamics.

Discussion and Conclusion

The computer vision approach effectively captured day-to-day variation in pig behaviour and activity. Reliable performance, however, depended strongly on high-quality and consistently positioned video data.

WEL-PP-03

PAIN PERCEPTION IN PIGS AMONG VETERINARIANS IN POLAND – INFLUENCE OF GENDER AND PROFESSIONAL EXPERIENCE

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Background and Objectives

Pain in pigs is relevant for both animal welfare and production performance. The aim of this study was to assess how veterinarians in Poland perceive pain, evaluate their own knowledge and analgesic practices, and whether these aspects are influenced by gender and professional experience. Additionally, the study assessed perceived pain intensity in selected clinical conditions and procedures.

Material and Methods

An anonymous online survey was conducted among 72 veterinarians involved in pig health management (51 men, 21 women). Professional experience was: 1–5 years (n = 13), 6–10 (18), 11–19 (24), and ε20 years (17). The questionnaire included demographic questions, statements rated on a five-point Likert scale, and nine 0–10 pain intensity questions related to physiological and difficult farrowing, mastitis, lameness, fractures, shoulder ulcers, respiratory and digestive diseases, and tail docking in piglets. Data were analyzed descriptively and stratified by gender and experience.

Results

Approximately 65% of respondents disagreed that recognizing pain in pigs is difficult. More than half did not agree that pigs are less sensitive to pain than humans. Female veterinarians more often considered pigs to be highly pain-sensitive, discussed pain management more frequently with farmers, and rated pain intensity higher in most clinical situations. Less experienced veterinarians initiated more discussions about pain, whereas the most experienced rated pain higher (e.g. mastitis 8.3; lameness 7.8) and more often indicated insufficient drug availability. The highest mean pain scores (0–10) were noted for limb fracture (9.3), difficult farrowing (8.2), and mastitis (7.6).

Discussion and Conclusion

Polish veterinarians consider pain in pigs an important clinical and welfare issue. Female and more experienced veterinarians emphasized pain severity more strongly, while younger practitioners were more likely to initiate discussions with farmers. The results highlight the need for practical training in analgesia, standardization of pain management protocols, and improved veterinarian–farmer communication in context of pig welfare.

WEL-PP-04

EFFECTS OF ADMINISTRATION PERIOD ON THE EFFICACY OF BIOPLUS® YC IN SOWS AND THEIR LITTERS: A FULL-CYCLE VERSUS LACTATION-ONLY ASSESSMENT

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Background and Objectives

Through their immunomodulatory effects, probiotics may enhance the productivity of sows and their piglets. The objective of this study was to evaluate the effect of a Bacillus-based probiotic on performance when administered during lactation only or a full cycle.

Material and Methods

The experiment was performed during one reproductive cycle on 216 sows (DanBred) divided into three treatment groups (n=72/group): Control (T1), BPYC-Lac (T2), and BPYC-Gest&Lac (T3). In group T2, sows were administered with the probiotic only in lactation feed, whereas sows in T3 received the probiotic during both gestation and lactation. The experimental groups received a probiotic containing B. subtilis–810A and B. licheniformis–809A (1.28E+09 CFU/kg feed). Suckling piglets from the experimental groups were offered creep feed with the same probiotic. Zootechnical performance parameters were measured and statistically evaluated.

Results

Sows administrated with the probiotic product during lactation only (T2) and the full cycle (T3) were characterized by significantly (Pδ0.01) reduced back fat (3.23 vs. 2.83 and 2.72 mm) and BW loss during lactation (32.2 vs. 28.8 and 26.1 kg), as well as better BCS after weaning (2.37 vs. 2.59 and 2.59). Dietary supplementation with the probiotic (T3) during the full cycle significantly increased (Pδ0.01) piglet birth weight (1.17 vs. 1.28 kg), litter creep feed consumption (4.67 vs. 5.21 kg), and piglet weaning weight (6.71 vs. 7.23 kg) compared with T1. The use of the Bacillus-based probiotic during lactation only (T2) and the full cycle (T3) significantly improved (Pδ0.01) litter weaning weight (66.9 vs. 72.5 and 74.4) compared with T1.

Discussion and Conclusion

Full-cycle supplementation of BioPlus® YC to sows and their piglets consistently yielded the greatest improvements in zootechnical performance. Supplementation during lactation only, including creep feed for piglets, resulted in intermediate performance improvements. This highlights the added value of extending probiotic use into gestation.

WEL-PP-05

BOTANICAL SUPPLEMENTATION: AN EFFECTIVE TOOL TO REDUCE TAIL BITING IN PIGS FARM

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Background and Objectives

Tail biting represents a significant welfare problem in pig farming. This behavior induces stress and injuries, with a negative impact on health and performance. This study assessed the impact of a natural solution based on Melissa officinalis and magnesium supplementation on tail biting and behavior in a commercial pig farm.

Material and Methods

After weaning at 28 days, pigs were allocated to either a supplemented (S, n=103) or a control (C, n=102) group in identical environments, under commercial conditions. All pig tails were graded once a week from week 7 to week 21. When fresh blood was observed, the supplement (Care Zen) was added to the water supply (1 L/1000 L) for a 5-day period. In both rooms, one pen was video-recorded at 3 different periods for 3 consecutive days. The videos were analyzed using the scan sampling method to assess tail biting, resting, exploring, and feeding behaviors. A principal component analysis and a hierarchical ascending classification were used to analyze behavioral data and create clusters of pigs defined by their behavior. All assessments were carried out by a blinded evaluator.

Results

In total, two supplementation periods took place. Tail lesion intensity decreased after the first supplementation throughout the trial period, in S, while it continued to rise in C. On videos, tail biting observations were significantly lower (Fisher, p-value<0.05) for S, where pigs also tended to rest more. From video observations, three groups were identified: Younger, Explorative, and Resting pigs. The C group contained more Explorative and biting pigs (Dunn, p-value <0.05), while the S group included more Resting ones. Younger pigs appeared equally in both groups, with a lower average age than the other pigs.

Discussion and Conclusion

These results show that supplementation with a standardized botanical product can significantly reduce tail biting and its impact on pigs, likely through a calming effect.

WEL-PP-06

VALIDATION OF A COMMERCIAL CORTISOL ELISA FOR NON-INVASIVE ASSESSMENT OF STRESS IN PIGS

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Background and Objectives

Measuring long-term stress is important for improving housing conditions in swine production. In other species, such as cattle, chronic stress leads to a significant decrease in cortisol levels. Nevertheless, a sampling method not influencing the values by the measures themselves, is needed. Therefore, saliva provides a practical alternative to serum for field-based monitoring. However, most commercial cortisol ELISAs are validated for serum or plasma, their performance in porcine saliva remains insufficiently characterised. This study aimed to conduct an analytical validation of a commercial competitive cortisol ELISA for use with porcine saliva.

Material and Methods

Analytical validation assessed intra-assay precision, linearity under dilution (LUD), spike-and-recovery, matrix effects, and four-parameter logistic (4PL) curve fitting. Saliva and serum samples were collected from healthy pigs (n = 23) and chronically diseased pigs (n = 8) to evaluate potential matrix-related differences. Serial dilutions, recovery experiments, and back-calculated standard curves were used to determine assay accuracy, sensitivity, and robustness across the analytical range.

Results

In saliva, the intra-assay coefficients of variation remained consistently below 15%. The LUD analysis showed excellent linearity (R^2 > 0.98), confirming proportional dilutability across the working range. The spike-and-recovery values were within the specified acceptance limits of 90–110%, indicating only minimal interference with saliva-specific components. The 4PL calibration curves showed excellent goodness-of-fit for both saliva and serum (R^2 > 0.99). Porcine cortisol levels in saliva were one-sixteenth of the serum levels.

Discussion and Conclusion

The commercial cortisol ELISA met all analytical performance criteria for porcine saliva, demonstrating high precision, accuracy, and compatibility with this non-invasive matrix. These findings support saliva as a reliable alternative to serum for cortisol quantification, providing a robust methodological foundation for future stress and welfare monitoring in pigs. Regarding the interpretation of saliva results in future studies, it can be assumed that these represent approximately 6.25% of serum cortisol values.

WEL-PP-07

EVALUATION OF THE EFFECTS OF MISTRAL®, A DESICCANT BASED ON EUCALYPTUS ESSENTIAL OIL, ON NEWBORN PIGLET BEHAVIOUR

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Background and Objectives

Hypothermia at birth is a major risk factor for piglet mortality. Desiccants are commonly used to help warm piglets after birth, and the addition of essential oils may enhance their effectiveness. This study evaluated the effects of Mistral®, a desiccant containing natural eucalyptus essential oils, on early-life piglet behaviour under experimental conditions.

Material and Methods

Three treatments were applied to 255 piglets from 24 litters across two batches: 27% received no desiccant, 35% received a conventional desiccant without essential oils, and 38% received a desiccant containing natural eucalyptus essential oils. Before the trial, piglets were randomly assigned to treatments within each litter based on their birth order. Rectal temperatures were measured, and farrowing crates were video recorded from farrowing until 10 hours post-birth. Data were analysed while accounting for potential effects at the piglet, sow and batch levels, incorporating fixed factors (birth weight, birth order, litter size and parity) and random factors (batch number and sow).

Results

In all groups, rectal temperature fell by an average of 2°C in the first 30 minutes and did not recover within 120 minutes, indicating early hypothermia. Video analysis showed that the treatment influenced area use. Indeed, piglets that received the eucalyptus essential oil desiccant spent significantly more time at the udder ($P < 0.05$) and significantly less time in colder areas ($P < 0.01$) than those in the other groups.

Discussion and Conclusion

This study demonstrated that the use of a desiccant influenced the behaviour of newborn piglets, leading to different space-use patterns depending on the treatment. As the trial was conducted in a highly prolific herd and considering both the increasing litter sizes and the confirmed risk of hypothermia in low-birthweight piglets, these findings are promising. Further research is needed to confirm these results under a variety of conditions, including different, animals, management practices and environments.

WEL-PP-08

EFFECTS OF DIETARY SUPPLEMENTATION WITH ANANDAMIDE AND CITRIC ACID ON GROWTH, MORTALITY, AND TREATMENT INCIDENCE IN WEANED PIGS DURING THE HIGH-TEMPERATURE PERIOD

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Background and Objectives

Heat stress exacerbates inflammatory and oxidative processes in weaned pigs, leading to lethargy, dehydration, and subsequent impairments in feed intake, growth, and health. This study evaluated whether dietary supplementation with anandamide (AEA) or citric acid (CA), known for their anti-inflammatory, analgesic, and antioxidant properties, can alleviate growth retardation, mortality, and disease incidence in weaned pigs exposed to high ambient temperatures.

Material and Methods

The experiment was conducted at a commercial farm in Korea from July to August 2025, the external temperature was ranged 20.5-34.8°C. A total of 600 pigs (Landrace × Yorkshire × Duroc; 6.67 ± 1.37 kg) weaned at between 21 and 28 days of age, were randomly allocated to 4 experimental groups (2 replicates/group): Control (n=152, 2,000 ppm rice hulls), A1 (n=150, 1,000 ppm AEA + 1,000 ppm rice hulls), A2 (n=147, 2,000 ppm AEA), and CA (n=151, 2,000 ppm citric acid). Supplements were top-dressed onto the basal diet and provided six times per day during days 1 to 7 post-weaning. Growth performance and mortality were assessed on days 0 (weaning), 7, and 21, and treatment incidence was recorded during 35 days post-weaning.

Results

No significant differences were observed in average daily gain (ADG) or G:F ratio among groups except that ADG in A1 group during days 7 to 21 was lower than in CA group ($p<0.05$). Mortality also did not differ among treatments. However, the A2 group showed a lower treatment incidence at day 35 compared to the Control and A1 groups.

Discussion and Conclusion

In conclusion, short-term supplementation with AEA or CA for 7 days did not noticeably influence on growth performance under high temperature, but a higher dose of AEA demonstrated a potential benefit in enhancing disease resistance. Further studies are needed to confirm the long-term effects of AEA and to determine the optimal inclusion level under heat-stress conditions.

WEL-PP-09

COMPARISON OF TWO VACCINATION PROTOCOLS DIFFERING IN THE NUMBER OF INJECTIONS AND ITS EFFECT ON THE WELFARE OF GESTATING SOWS

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Background and Objectives

Vaccination is essential for disease prevention in pig production. However, repeated intramuscular (IM) injections can compromise animal welfare. This study evaluated the impact of two vaccination protocols on gestating sows, under commercial farm conditions: one based on a single IM injection (VAC1) and the other on three separate IM injections (VAC3).

Material and Methods

Sixty-four pregnant sows were randomly assigned to either VAC1 or VAC3. Each vaccination protocol was administered twice: 6 weeks (dose 1) and 3 weeks (dose 2) before the expected farrowing date. The main variables monitored were the time required for vaccination and welfare assessments, including behaviour, vocalizations, fear responses, physiological biomarkers, and health before and after vaccination.

Results

The VAC1 protocol reduced handling time per sow (13.3 ± 1.39 sec/sow in VAC1 vs. 38.3 ± 2.23 sec/sow in VAC3; $p < 0.0001$). Both protocols led to decreased activity, exploration of enrichment material, and altered resting behaviour. Sows in the VAC3 treatment displayed more behavioural indicators of pain and fear during injection, including a higher incidence of rushing or retreat attempts (37.4 % ± 9.41 in VAC1 vs. 62.1 % ± 9.47 in VAC3; $p = 0.0139$), back arching (17.2 % ± 5.11 in VAC1 vs. 39.6 % ± 6.67 in VAC3; $p = 0.0127$), and high-pitched vocalizations. Health parameters (local reactions and rectal temperature) and farrowing performance did not differ between protocols. Salivary haptoglobin and chromogranin A reached their highest concentrations 6h post-vaccination in both groups.

Discussion and Conclusion

Both protocols caused mild changes that were consistent with normal post-vaccination responses. VAC1 may improve on-farm applicability and sow welfare compared to VAC3, as indicated by the handling time per sow and behavioural indicators of pain and fear during injections. Further research is needed to evaluate the positive impact on the human-animal relationship, chronic stress biomarkers, and productive performance.

WEL-PP-10

CHANGES IN SALIVARY BIOMARKERS IN PIGS AFTER MIXING

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Background and Objectives

Social stress caused by mixing unfamiliar pigs is a major welfare concern, as regrouping provokes aggressive interactions and the establishment of new hierarchies. Non-invasive biomarkers can be a potentially useful tool to assess the acute stress generated during these events. This study aimed to evaluate the sensitivity of several salivary biomarkers related to stress, welfare, and immune activation in detecting the physiological impact of social stress triggered by mixing unfamiliar pigs.

Material and Methods

Twenty female pigs (Landrace × Large White, transition period) were divided into two groups: a mixed group (n=10), in which animals were regrouped and displayed aggressive interactions, and a control group (n=10) with no social disruption. Saliva samples were collected at baseline, 3 hours post-mixing, the following day, and at 3 and 7 days post-mixing.
The biomarkers analysed included stress-related markers (cortisol, cortisone, chromogranin A), positive welfare markers (oxytocin), immune/inflammatory markers (adenosine deaminase, S100A12), and the Well-Sal, a previously developed welfare biomarker. A Welfare Quality® lesion score was used to quantify injuries produced by aggression.

Results

All biomarkers except cortisol showed a significant increase at 3 hours post-mixing, returning to baseline by day 7. The largest differences between baseline and 3 hours post-mixing were observed for Well-Sal, cortisone, and adenosine deaminase (4.09-, 2.90-, and 2.64-fold), with cortisol showing no significant changes. No changes occurred in the control group. Lesion scoring confirmed injuries exclusively in the mixed group.

Discussion and Conclusion

The increases found in stress- and inflammation-related biomarkers indicate their usefulness for monitoring welfare during acute social stress caused by mixing. The absence of a cortisol increase agrees with previous findings showing that this hormone does not always reflect short-term social stress, reinforcing the value of a multi-biomarker approach.

WEL-PP-11

EFFECT OF A PHYTOBIOTIC MIXTURE ON WEANING PERFORMANCE AND DIARRHEA IN PIGLETS AFTER ZNO REMOVAL

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Background and Objectives

Following the removal of pharmacological ZnO levels from piglet diets in the EU, producers report persistent challenges with post-weaning diarrhea. A phytobiotic mixture containing curcumin and fenugreek was developed as a potential alternative of antimicrobials. This study aimed to evaluate its effect on diarrhea incidence and performance under commercial conditions.

Material and Methods

The trial was performed in a farrow-to-finish farm with three farrowing barns. Each unit was divided into 6 Test and 6 Control litters (in total 18 litters/treatment). Piglets in the Test group received creep feeding supplemented with the additive from nine (9) days prior to weaning until 2 weeks after weaning; while the Controls were fed with the same feed without additive. Piglets were weaned at 26 ± 3 days. After weaning, piglets were moved to 2 Test and 2 Control nurseries, including 8 pens in both treatment groups (18 piglets/pen) balanced for litter of origin and sex. Groups were homogenous by weight at weaning. Fecal consistency was scored daily using a 1–4 scale at pen level. Statistical evaluation was done by t test for continuous variables and Mann-Whitney U test was applied for fecal scores and Fisher's exact test for incidence/duration of diarrhea.

Results

Both fecal scores (median Test=2.5 vs Control=3) and incidence/duration of diarrhea (T=6 vs C=37; days/pen) were significantly lower in the Test group ($p<0.0001$). 14 days after weaning average daily gains and feed conversions were significantly improved in the Test groups. (ADG: T=196.1±15.5 g vs C=152.9±23.8 g; p=0.001, FCR: T=1.73±0.14 vs C=2.19±0.31; p=0.002).No medication was required in the Test pens, while antibiotic medication due to diarrhea outbreaks was required in the Control units.

Discussion and Conclusion

Results indicate that the curcumin–fenugreek seed mixture reduces post-weaning diarrhea and the necessity for antimicrobial treatments while simultaneously maintains optimal growth rates during the weaning phase.

WEL-PP-12

ASSESSING SENSOR-BASED DETECTION OF HEAT STRESS IN WEANED PIGLETS USING BEHAVIOURAL INDICATORS

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Background and Objectives

A temperature-humidity-index (THI) was developed for fattening pigs (De Prekel et al. 2024), however, heat stress (HS) in weaned piglets has scarcely been researched. This study aimed to identify behavioural indicators for HS (BI) and determine a THI-threshold for weaned piglets.

Material and Methods

In six pens, BI of weaned piglets (n=144) were analysed in relation to the mean half-hourly THI. Two four-day periods were selected in which the mean daily THI remained below the threshold-value of 75 for two days before the threshold-value was exceeded for two consecutive days. Using half-hourly scan-sampling of video recordings (AXIS-M3206-LVE, Axis-Communications-AB, SWE), BI were examined. BI included the number of animals lying in the manure area (MA), lateral, sternal and without physical contact (BC) within the entire pen. The number of animals exhibiting each BI was then correlated with the corresponding THI-values to identify those most suitable for HS-detecting in weaned piglets. To define thresholds, THI-values were grouped into 1-unit intervals and pairwise comparisons between THI-groups were performed.

Results

Significant moderate correlations between THI and MA ($\rangle$=0.27, p<0.001) and between THI and BC ($\rangle$=0.37, p<0.001) were detected. For MA and BC, a significant difference was found between the THI-groups [74,75) and [75,76) (p_{adj}=0.006).

Discussion and Conclusion

The significant correlations between MA and BC and THI indicate them as suitable indicators for HS-detecting, while the significant difference between the THI-groups suggests that a THI-value of 75 can be interpreted as potential threshold for behavioural changes in weaned piglets. The results represent a significant step toward sensor-based HS-detection to improve animal welfare.The project was supported by funds of the Federal Ministry of Agriculture, Food and Regional Identity (BMLEH) based on a decision of the Parliament of the Federal Republic of Germany via the Federal Office for Agriculture and Food (BLE) under the strategy for digitalisation in agriculture.

WEL-PP-13

REAL-TIME SOW TEMPERATURE MONITORING TO EXPLORE LINKS WITH REPRODUCTIVE PARAMETERS AND STRESS BIOMARKERS UNDER HEAT STRESS: PRELIMINARY RESULTS FROM ADAMIT-LIVESTOCK HS

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Background and Objectives

Heat stress, amplified by climate change, is a growing constraint for intensive pig production and can impair thermoregulation and fertility in sows. The AdaMit-Livestock HS project ("Study on the impact of heat stress on livestock: Adaptation and Mitigation") evaluates heat-stress impacts on livestock health, welfare and productivity in Greece. This study reports preliminary outcomes from the sow monitoring workstream, combining high-frequency body-temperature sensing with environmental monitoring and farm performance records.

Material and Methods

Environmental temperature and relative humidity are logged in and around housing to compute the temperature–humidity index (THI), using the devise ''Kestrel 5400AG Cattle Heat Stress Tracker'' for micro-climate measurement and monitoring. Clinical monitoring includes 24-h ear-temperature sensors complemented by on-farm observations. Clinical and reproductive parameters and litter characteristics (e.g., anorexia, backfat at farrowing and weaning / farrowing, abortion, return to oestrus rate, duration of gestation / number of total born, born alive, stillborn, mummified and weaned piglets) are extracted from herd management systems as well as blood samples for analysis for biomarkers redox status (TBARS, CARBS, TAC) were collected. These data are harmonised with sensor time series. In a first pilot deployment, valid ear-temperature measurements were collected at 15-min intervals.

Results

The temperature-monitoring workstream determined whether real-time body-temperature signals in sows can function as early-warning indicators of impending changes in reproductive performance. By continuously recording ear temperature, we identified subtle deviations or patterns that may precede reductions in sow productivity and reflect early physiological stress.

Discussion and Conclusion

The study implemented during both high-temperature and low-temperature periods, allowing the investigate of the specific contribution of heat stress to temperature irregularities and subsequent reproductive outcomes. These longitudinal datasets will later form the basis for modelling approaches that evaluate whether temperature-based features can reliably predict at-risk animals and serve as actionable early-warning tools in the broader context of heat-stress mitigation within the AdaMit-Livestock HS project.

WEL-PP-14

SELENITETRIGLYCERIDE SUPPLEMENTATION IN SOWS AS A STRATEGY TO PREVENT SELENIUM DEFICIENCY IN PIGLETS

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Background and Objectives

Selenium deficiency is a common problem in pig production, particularly in sows during pregnancy and lactation. Insufficient supplementation can lead to impaired immunity, increased piglet mortality, and developmental disorders. New organic forms of selenium are characterized by higher bioavailability, better utilization, and greater safety compared to inorganic forms. The aim of this study was to determine the effect of short-term supplementation of sows with an organic selenium form (selenitetriglycerides) on serum selenium concentration and transfer to piglets.

Material and Methods

The study was conducted on 12 Large White sows in the third and fourth lactation and their piglets – 12 (one per sow). Animals were divided into a control and an experimental group. Sows in the experimental group were orally administered selenitetriglycerides at 0.5 mg Se/kg body weight 15, 10, 5, and 3 days before parturition. Selenium concentration was measured in sow serum before and after farrowing and in piglet serum at 3, 5, 10, and 15 days of age. Additionally, glutathione peroxidase (GSH-Px) activity was analysed in sows.

Results

In sows supplemented with organic selenium, serum selenium concentration increased significantly after five days ($p < 0.05$), and GSH-Px activity reached its highest levels after parturition. Piglets born to supplemented sows had significantly higher serum selenium concentrations compared with the control group ($p < 0.05$), confirming transfer of the element via the placenta and milk.

Discussion and Conclusion

Supplementation of sows with organic selenium is an effective way to prevent selenium deficiency in piglets. Short-term administration of selenitetriglycerides during late pregnancy increased selenium levels and antioxidant enzyme activity in sows and elevated selenium concentrations in newborn piglets. The results confirm the practical value of this selenium form as a safe and effective alternative to inorganic supplements, improving piglet health. (Świerczyński et al., Journal of Elementology, 2023).

WEL-PP-15

ON-FARM APPLICATION OF THE AFFECT DOMAIN OF A QUALITY OF LIFE TOOL IN PIGS: A PROOF-OF-CONCEPT STUDY

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Background and Objectives

Ensuring the welfare of pigs on farms requires monitoring both their physical health and their emotional experiences, highlighting the need for tools that capture how pigs feel as well as their overall health status. This proof-of-concept study evaluated whether the "affect domain" of a pig Quality of Life (QoL) tool (Wiseman-Orr et al., 2011) could be effectively used by farm caregivers to support welfare assessment across different production stages.

Material and Methods

A cross-sectional observational study was conducted on a commercial pig farm in Canada, enrolling 34 pigs across nursery and grower stages. Researchers independently classified the overall condition as Good, Neutral, or Not Good for each pig. The QoL tool's affect domain was administered to generate group-level median QoL scores. Scoring was based on expert-rated QoL impact for each item using a 100-mm visual analogue scale, with domain scores calculated as the mean of indicator item scores. Non-parametric statistical analyses (Kruskal-Wallis and post hoc pairwise comparisons) assessed differences across assigned groups for the full cohort and within subgroups.

Results

Overall, Quality of Life scores were significantly higher in pigs rated as Good (median: 83, n=12) or Neutral (median: 82, n=12) compared to Not Good (median: 39.5, n=10; $p=0.0005$). In nursery pigs, QoL scores did not significantly differ between groups. Among growers, Good (84.5, n=6) and Neutral (83, n=6) pigs had significantly higher scores than Not Good (25, n=6; $p<0.0001$).

Discussion and Conclusion

These results show that the QoL tool's affect domain is a valid and practical method for monitoring pig wellbeing on farms. Using this tool in routine welfare checks can help farmers better understand how pigs are feeling, identify animals in poor condition earlier, and make more informed decisions to improve overall welfare in pig production systems.

WEL-PP-16

CLINICAL SIGNS AND LESIONS IN SOWS IN FLEMISH COMMERCIAL PIG FARMS

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Background and Objectives

Reproductive performance in pig farms has increased significantly during the past decades. This puts pressure on sow health and welfare, resulting in an increased risk of disease. Measuring the prevalence and severity of clinical signs and lesions can help to monitor sow health and welfare in farms.

Material and Methods

This field study was conducted in three commercial pig farms to collect information on clinical signs and lesions in sows. The investigated parameters were lesions of the hind claws, udder and vulva, shoulder ulcerations, lameness, diarrhoea and respiratory signs. In each farm, 120 sows were included i.e. 30 sows per production phase (farrowing, weaning, early and late gestation). The prevalences and severity (score 0-3) of these conditions were assessed.

Results

The following mean (min.-max.) prevalences were obtained: claw lesions 93.9% (90.0%-95.8%), udder lesions 29.2% (22.5%-35.8%), vulva lesions 18.9% (11.7%-25.8%), shoulder ulcerations 44.7% (35.0%-54.2%), lameness 39.5% (20.8%-59.2%), diarrhoea 3.3% (1.7%-6.7%) and respiratory signs 1.3% (0.0%-4.2%). Udder (63.3%) and vulva lesions (30.0%), and shoulder ulcerations (67.8%) were most prevalent in the farrowing unit, diarrhoea (6.1%) mainly in gestation. Overall, lesions were mild (score 1) or of moderate (score 2) severity.

Discussion and Conclusion

The prevalences generally corroborate with those found in literature (Heinonen et al., 2013; Nalon et al., 2013), but higher prevalences were found for udder lesions (29.2%) and lameness (39.5%). This may be because very mild lesions were also recorded. Additional studies are required to identify causes (e.g. deficiencies in housing and management) and measures to mitigate or prevent these conditions for optimal sow health.

WEL-PP-17

FAECAL CALPROTECTIN AS A BIOMARKER OF GUT HEALTH IN LOW-FEED INTAKE PIGLETS POST-WEANING

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Background and Objectives

Faecal calprotectin (fCal), a neutrophil-derived alarmin, is associated with intestinal wall damage and offers a non-invasive biomarker for monitoring poor feed intake after weaning. This study examined fCal concentrations in relation to pre- and post-weaning individual data in piglets fed via electronic feeding stations after weaning.

Material and Methods

Twenty Hypor Libra × Hypor Maxter piglets were randomly sampled one day before weaning to establish baseline fCal levels. To capture extremes in feed intake, 32 additional piglets were selected at two post-weaning time points (day 3 and 19) from eight pens, including two pigs per pen with high (509 ± 27 g) and two pigs low (118 ± 25 g) cumulative feed intake during day 0-3. Samples were collected via rectal stimulation and analysed using immunoturbidimetric test (Bühlmann fCAL® turbo test, Switzerland). Data were analysed using mixed models, with Pearson correlations and regressions between fCal and performance metrics.

Results

Mean fCal was 22.7 µg/g pre-weaning (CV = 73%), 11.9 µg/g at day 3 (CV = 86%), and 5.68 µg/g at day 19 (CV = 46%). fCal was not associated with birth weight or pre-weaning growth, except at day 3, where variation was partly explained by pre-weaning growth (R^2 = 0.12). Negative correlations were observed between day 3 fCal and feed intake (P = 0.027) and growth (P = 0.039) during the first three days. Day 3 fCal was higher in pigs with low initial feed intake (P = 0.001), which also showed 28% lower growth during the post-weaning period compared to high-intake counterparts. By day 19, fCal was no longer associated with performance.

Discussion and Conclusion

In conclusion, fCal was highly variable and appeared a promising early biomarker for immediate post-weaning feed intake and growth. In older pigs, the associations were lost as other factors become more influential and intestinal health stabilizes.

WEL-PP-18

EFFECT OF AN EARLY-LIFE ISOTONIC PROTEIN DRINK ON THE OCCURRENCE OF FALL-BEHIND PIGLETS AT WEANING ACROSS 29 FIELD TRIALS

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Background and Objectives

Piglets classified as fall-behinds at weaning grow poorly, eat less and have higher morbidity/mortality subsequently. This results in fewer full-value pigs for sale, causing economic losses. The aim of this study was to assess the effects of an isotonic protein drink (IPD) delivering key nutrients to gut cells, on the percentage of fall-behinds at weaning in a large collection of field trials.

Material and Methods

Twenty-nine studies (35,643 piglets) across 7 countries were analysed. Within study, litters were randomly assigned to IPD (Tonisity Px – Tonisity International, Ireland) or Control. IPD piglets received 3% IPD solution in open piglet feeders between days 2 and 8 of life and three days pre-weaning. Control piglets received either no supplementation (18 studies), water (as per the IPD protocol; 7 studies), or a market-available electrolyte (administered as per label recommendations; 4 studies). Within study, treatments were housed in the same farrowing rooms. 'Fall-behinds' were identified as the lightest 15-20% of piglets (27 studies), or those visually assessed as weak (2 studies). Data were logit-transformed to normality and analysed using a mixed model (JMP 19) with study as a random effect and the inverse of sum of within- and between-study variance as a weighting factor. Data were back-transformed to the original (%) scale for presentation. Comparisons were further stratified by Control additive type.

Results

The IPD significantly reduced the fall-behinds vs Control (12.7±0.7% versus 19.9±1.0%; $p<0.0001$). The reduction was consistent regardless of Control additive: no supplementation (13.4±0.9% versus 21.1±1.3%; $p<0.0001$), water (12.5±1.4% versus 21.0±2.1%; $p<0.0001$), or competitors (10.0±1.5% versus 14.1±2.0%; $p=0.01$).

Discussion and Conclusion

The IPD reduced the percentage of fall-behinds across various management systems regardless of Control supplementation. IPD is an effective early-life intervention, improving piglet quality and enhancing pig productivity under commercial conditions.

WEL-PP-19

CHANGES IN BIOMARKERS OF THE IMMUNE SYSTEM AND REDOX STATUS IN SALIVA ASSOCIATED WITH HEAT STRESS IN PIGS

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Background and Objectives

Heat stress occurs when environmental temperature and humidity exceed the animal's ability to dissipate internal heat, being especially important in pigs due to their limited sweating ability. From a production standpoint, heat stress reduces feed intake and overall efficiency, leading to slower growth, lower fertility, and, in severe cases, increased mortality.The objective of the present study was to describe the changes produced in salivary analytes in pigs that had a heat stress episode in a commercial farm.

Material and Methods

A total of 34 Landrace x Large White pigs, of 8 weeks of age, were exposed to elevated temperatures for one week due to a heat wave during summer of 2024. All pigs showed symptoms related to heat stress, such as hyperthermia or fatigue.A profile of salivary analytes, including biomarkers of inflammation (haptoglobin), immune system (adenosine deaminase, Serpin B12, total proteins, and calprotectin) and redox status (cupric reducing antioxidant capacity and advanced oxidation protein products), was measured at the onset of clinical signs and after 15 days, when the animals had recovered after a treatment based on supplementation of ovalbumin via tube feeding.

Results

Heat stress significantly increased inflammatory and immune system biomarkers. Haptoglobin, Serpin B12, and calprotectin showed the most significant increases, reaching 2.46,1.5, and 2.5- fold values on the day that signs began compared to day 15, respectively. No significant changes were observed in redox status biomarkers.

Discussion and Conclusion

This study showed that heat stroke produces changes in saliva that could indicate the presence of inflammation and activation of the innate immune response.

WEL-PP-20

MURAMIDASE IMPROVES GASTROINTESTINAL FUNCTIONALITY AND PERFORMANCE OF POST WEANED PIGLETS: A META-ANALYSIS

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Background and Objectives

Post-weaning piglets are particularly susceptible to digestive disturbances, reducing growth and feed efficiency. Dead bacterial cell debris, particularly peptidoglycans, is an largely unrecognized stressor for gut functionality and performance. Muramidase breaks down peptidoglycans, supporting gut functionality and performance. This meta-analysis combined data from three studies, each designed to achieve a 2% improvement in feed conversion ratio (FCR), to evaluate the overall effect of muramidase supplementation in weaned piglets.

Material and Methods

Three independent efficacy trials were conducted at research stations in Denmark and Germany using Danbred crossbred piglets (Duroc or Piétrain). Piglets were allocated to either a control or muramidase-supplemented group. Trial 1 included 1200 piglets, with 60 replicates and 10 pigs/pen. Trial 2 included 80 piglets, 20 replicates and 2 pigs/pen. And trial 3 included 1280 piglets, 64 replicates with 10 pigs/pen. Diets were based on wheat, barley, soybean meal, and included whey protein in the pre-starter phase. Trials lasted six weeks (two weeks pre-starter, four weeks starter). Performance parameters (average daily gain [ADG], feed intake [FI], FCR) and fecal consistency scores (0=normal to 3=severe diarrhea) were recorded. Data were analyzed using ANOVA with muramidase supplementation as the main effect.

Results

Across all trials, supplementation improved ADG by 16 g/day ($p<0.05$) and FCR by 0.04 units ($p<0.001$), corresponding to a 3% improvement. Fecal consistency scores were 25% improved in both pre-starter and starter phases ($p<0.05$).

Discussion and Conclusion

Muramidase supplementation consistently enhanced performance and digestive health, as demonstrated by a 3% improvement in FCR and 25% lower prevalence of diarrhea. These findings support the practical application of muramidase supplementation in piglet diets to optimize post-weaning performance and gut health, offering a promising strategy for sustainable piglet health management in commercial production.

WEL-PP-21

FAECAL MICROBIAL SHIFTS ASSOCIATED WITH LARGE LITTERS ARE CORRELATED WITH FARROWING DURATION AND SALIVARY CORTISOL IN PRIMIPAROUS SOWS

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Background and Objectives

Large litter sizes increase the risk of farrowing disorders with physiological stress in sows. This study aimed to explore alterations in gut microbiota associated with litter size in primiparous sows and to investigate their correlations with farrowing duration and cortisol levels.

Material and Methods

Twenty-two primiparous sows (Landrace x Large white) were assigned to two groups based on litter size: NL, normal litter (n=8; litter size 11.5 ± 1.0; range 7-14) and LL, large litter (n=14; litter size 15.6 ± 0.3; range 15-18). Farrowing duration was recorded through video analysis. Saliva samples for cortisol assay and faecal samples for microbiota analysis via full-length 16S rRNA gene sequencing were collected on day 1 after parturition.

Results

Compared to NL group, LL group showed higher abundances of genera Roseburia (0.16 vs. 0.02%, $P < 0.05$) and Murdochiella (0.26 vs. 0.00%, $P < 0.05$). In addition, LL group exhibited numerically higher abundances of the phylum Campylobacterota (3.59 vs. 0.01%, $P = 0.11$) and the species Campylobacter coli (3.21 vs. 0.00%, $P = 0.06$), but numerically lower proportions of the genus Lactobacillus (3.73 vs. 15.58%, $P = 0.16$) and the species L.gasseri (0.92 vs. 10.28%, $P = 0.10$) and L.reuteri (1.71 vs. 3.39%, $P = 0.27$). Farrowing duration was positively correlated with Campylobacterota ($r = 0.46$, $P < 0.05$), Roseburia ($r = 0.43$, $P < 0.05$), and Campylobacter coli ($r = 0.45$, $P < 0.05$), and tended to be negatively correlated with Lactobacillus ($r = -0.37$, $P = 0.09$). Additionally, salivary cortisol levels were positively correlated with Campylobacterota, Campylobacter coli, and Roseburia ($r=0.45$, 0.47 and 0.51, respectively, $P < 0.05$ for all).

Discussion and Conclusion

In conclusion, these findings suggest that large litter size may adversely influence the gut microbial composition of primiparous sows, potentially through prolonged farrowing duration and increased physiological stress at the postpartum stage.

WEL-PP-22

POLYHERBAL ANTI-STRESS COMPLEX FOR FINISHING PIGS: EFFECTS ON PERFORMANCE AND WELFARE

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Background and Objectives

Finishing pigs are exposed to stressors that increase free radical production, leading to oxidative stress and reduced performance. This study evaluated the performance and welfare of pigs supplemented with a polyherbal anti-stress complex (PAC, C-Power™), rich in highly bioavailable polyphenols (gallic acid, phenolic acids, and hydrolysable tannins), with strong antioxidant and anti-inflammatory activity, effectively reducing ROS, lipid peroxidation and inflammatory markers.

Material and Methods

Two studies were conducted on a high-productivity farm in Brazil, with DanBred animals. Trial 1 (winter) included 80 pigs (40 control, 40 supplemented), and Trial 2 (spring) included 440 pigs (220 control, 220 supplemented). For supplemented groups, the PAC was added at 100 g/ton to the diets from 120 to 151–155 days old. Animals were group-housed (20-22/pen). Measurements included body weight (BW), backfat thickness (Lean-Meter, Renco®), feed intake, and salivary cortisol and serotonin. Data were analysed by ANOVA using Minitab® 19.

Results

Pigs supplemented with PAC had better performance in both trials. In Trial 1, they presented higher average daily gain (ADG, 1.134 vs 1.242 kg; P=0.001), daily feed intake (DFI, 2.941 vs 3.111 kg; P<0.001), and final BW (120.56 vs 124.49 kg; P=0.053). Backfat gain was also lower (2.96 vs 2.09 mm; P=0.013), and feed conversion ratio improved (2.64 vs 2.50; P=0.032) in these animals. In Trial 2, PAC pigs had higher DFI (2.802 vs 3.007 kg; P<0.001) and ADG (1.134 vs 1.287 kg; P=0.001), and lower ADG variation (24.9 vs 18.22%; P=0.056), during the period of 135-151 days. Cortisol at 151 days was also reduced (324 vs 310 ng/mL; P=0.009), and serotonin increased (271 vs 294 ng/mL; P=0.022) in these animals.

Discussion and Conclusion

Dietary inclusion of C-Power™ in finishing pigs enhanced growth performance, reduced carcass fat, and improved stress and happiness biomarkers, promoting better welfare and productivity in intensive swine systems.

WEL-PP-23

FAECAL MICROBIAL SHIFTS ASSOCIATED WITH LARGE LITTERS ARE CORRELATED WITH OXIDATIVE STRESS, MATERNAL HORMONE, AND NURSING BEHAVIOUR IN PRIMIPAROUS SOWS

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Background and Objectives

Large litter size in sows adversely affect maternal hormones and oxidative stress, and our companion study revealed alterations in gut microbiota. This study explored the correlations between litter size-associated microbial taxa and oxidative stress indicators, prolactin concentrations, and nursing behaviour in primiparous sows.

Material and Methods

Twenty-two primiparous sows (Landrace × Large White) were assigned to normal litter (NL; n=8; litter size 11.5 ± 1.0; range 7–14) or large litter (LL; n=14; litter size 15.6 ± 0.3; range 15–18) group. Sows were video-recorded for 24 h on day 3 after parturition to assess nursing behaviour. On day 1 post-parturition, salivary oxidative stress parameters, colostral prolactin levels, and faecal microbiota profiles via full-length 16S rRNA sequencing were collected.

Results

Campylobacter coli, which showed higher abundance in the LL group, was negatively correlated with TEAC levels ($r = -0.43$, $P < 0.05$), and Roseburia, also more enriched in the LL group, showed a positive correlation with AOPP levels. In contrast, Lactobacillus and L.gasseri, which were less abundant in the LL group, showed negative correlations with TNF-ㄱ levels ($r = -0.57$, $P < 0.01$ for both). Additionally, Lactobacillus and L.reuteri showed positive correlations with prolactin concentrations ($r = 0.44$, $P = 0.05$ and $r = 0.47$, $P < 0.05$, respectively), and L.gasseri was positively correlated with total nursing frequency ($r = 0.48$, $P < 0.05$). Conversely, Campylobacter coli tended to show negative correlation with the total duration of nursing ($r = -0.40$, $P = 0.06$).

Discussion and Conclusion

In conclusion, these results suggest that microbiome alterations may contribute to physiological and behavioural challenges in sows with large litters, highlighting the potential of microbiome-targeted strategies to improve maternal health and lactation performance.

WEL-PP-26

PRECISION BIOTIC SUPPLEMENTATION MODULATES GUT-BRAIN AXIS AND NEUROCHEMICAL PROFILES IN WEANED PIGS UNDER SOCIAL STRESS

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Background and Objectives

A precision biotic (PB) was developed via targeted in vitro selection to modulate gut microbiome functionality and enhance stress resilience through the microbiome–gut–brain axis (Ren et al., 2024). Previous pig studies showed PB reduces cortisol under stress, enriches plasma pathways linked to neurotransmitter synthesis, increases microbial fermentation products (butyrate, propionate), and improves feed efficiency (Ren et al., 2025a–d). However, its direct impact on brain tissue remains unexplored. This study evaluated dietary PB effects on neurochemical changes in pigs under social stress.

Material and Methods

One hundred twenty piglets (6.8±1.04kg BW), 14 days post-weaning, were housed in 20 pens (6 pigs/pen, mixed gender). Pens were allocated to achieve similar average body weight per pen and assigned to one of two dietary treatments: a negative control (NC) or NC supplemented with 250ppm PB. The study lasted 28 days following a 14-day post-weaning adaptation period. Social stress was induced on day 21 by mixing three pigs from different pens within the same dietary treatment. On day 28, plasma, cecal content, and brain tissue samples were collected from 10 pigs per treatment to evaluate metabolomic and neurotransmitter profiles. Data were analyzed using JMP Pro 19.0, with statistical significance set at $P<0.05$.

Results

PB supplementation enriched gamma-aminobutyric acid (GABA) and dopamine pathways in cecal digesta, increasing GABA by 34%. Systemic noradrenaline and serotonin metabolism were altered ($P<0.05$). In brain tissue, PB affected dopamine in the cortex, tryptophan in the hypothalamus, and quinolinic acid in both regions ($P<0.05$). Growth performance was unaffected.

Discussion and Conclusion

PB enhanced microbial modulation of neurotransmitter synthesis, influencing brain metabolites linked to stress sensitivity, though plasma changes were limited. PB supports gut-derived metabolites associated with stress resilience and cognitive function. Further research is needed to clarify neurotransmitter–microbiome interactions and PB's mode of action.

WEL-PP-27

TIMING AND INTENSITY OF SERUM CORTISOL RESPONSE FOLLOWING NEEDLE-FREE INTRADERMAL VS. CONVENTIONAL INTRAMUSCULAR VACCINATION IN WEANED PIGLETS

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Background and Objectives

Extensive research has been done to understand the benefits of intradermal vaccination vs. intramuscular vaccination with a needle. While cortisol levels have been used to quantify stress responses in animals following vaccination, most publications have focused on behaviour assessments to determine stress. Those that measured cortisol typically sampled from saliva, with few studies sampling serum. It has been hypothesized that the cortisol in these studies was sampled either too soon or too late after vaccination to provide meaningful results. The objective of this study was to assess if there would be a significant difference between serum cortisol levels in weaned piglets one hour post-vaccination using an intradermal needle-free injection device vs. an intramuscular injection device with a needle.

Material and Methods

1123 weaned piglets were separated into groups: vaccinated intradermally with a needle-free device, intramuscularly with a needle, or not vaccinated as a control group but subject to the same environment and handling. Piglets from each group were randomly selected for blood sampling one hour post-vaccination. Serum was separated from the blood and cortisol levels were determined using chemiluminescence.

Results

Statistical analysis of the data determined that there was a significant difference between serum cortisol levels (nmol/L) in piglets vaccinated intradermally (min = <28.0, max = 268.0, mean = 94.8) vs. intramuscularly (min = 30.6, max = 579.0, mean = 185.9) ($p<0.001$). Interestingly, there was no significant difference between serum cortisol in piglets vaccinated intradermally vs. not vaccinated at all in the control group (min = <28.0, max = 189.0, mean = 91.8) ($p = 0.473$).

Discussion and Conclusion

Overall, vaccinating intradermally with a needle-free device greatly reduced the serum cortisol present one hour post-vaccination compared to using an intramuscular injector with a needle. These results have implications for improving the welfare of pigs during vaccination.

WEL-PP-28

VARIABILITY AND TIME-DEPENDENT CHANGES IN PIG WELFARE INDICATORS DURING FATTENING

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Background and Objectives

The Welfare Quality (WQ) protocols are widely implemented for monitoring farm animal welfare and for certification purposes. In growing pigs, the physiological and behavioural changes occurring throughout the production cycle may affect the outcome of the WQ protocol. Therefore, the aim of this study was to evaluate the temporal variability of different parameters (principles, criteria, and measures) of the WQ protocol in growing pigs, as well as the intra-farm variability of selected measures.

Material and Methods

The WQ protocol was performed by two trained assessors every two weeks during the fattening period in two separate buildings on a farm, from February to May 2023 (seven visits in one building and eight in the other). Measures obtained during each evaluation were subsequently aggregated into criteria and, ultimately, into principle level. Temporal patterns of the parameters were evaluated, and associations among measures were examined using Spearman's rank correlation. Intra-farm variability of selected measures was assessed for each visit using an exact permutation test, provided that the measure's prevalence and statistical power were sufficient.

Results

Variability in certain measures, criteria, and principles was observed depending on the timing of the assessment within the fattening period. The 'good housing' principle fluctuated consistently, but greater temporal variability was noted at the measure and criteria levels. In addition, several significant correlations were found between some measures and weight, which was used as a time-dependent variable. Regarding intra-farm variability, moderate wounds on the body and absence of manure, moderate and absence of bursitis, as well as the 'fear of humans' measure, showed significant differences in one, two, and three visits, respectively.

Discussion and Conclusion

This study highlighted potential differences in WQ scoring depending on the timing of the assessment during the fattening cycle. The temporal dynamics and intra-farm variability of these protocol outcomes require further investigation to improve the reliability of welfare monitoring protocols.

WEL-PP-29

PEAT PELLETS AS EDIBLE ENRICHMENT MATERIAL IMPROVED ZOOTECHNICAL PERFORMANCE AND INCREASED POSITIVE BEHAVIOR OF WEANED PIGLETS

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Background and Objectives

Biting behavior in piglets can indicate gastrointestinal discomfort or wellbeing challenges. Edible enrichment materials (EEMs) can direct piglets' attention towards positive behaviors. Peat is rich in fiber and humic acids with potential benefits to intestinal functions. This trial aimed to compare chopped straw (CS) and 8-mm peat pellets (PP) as EEM for weaned piglets with intact tails.

Material and Methods

At weaning, 288 piglets (8.3 ± SEM 0.03 kg) were allocated to CS or PP (ProHumi®, Hankkija Oy, Finland) treatments, with 12 pens/treatment and 12 piglets/pen. EEMs were provided ad libitum in floor-mounted bowls, while all piglets received the same pelleted diets, two cotton ropes, a floor-based rubber toy and a metal chain with solid ball. Piglets were weighed at days 0, 9, 14, and 28. Feed and EEM intake were measured for corresponding periods. Behavior (scan sampling, 160 scans/pig/day), ear and tail damage prevalence, and fecal consistency (8-point scale) were assessed on days 8 and 18, weekly and 3 times/week, respectively. Data were analyzed with GenStat® Version 24 for Windows™, using batch, room, and replicate as blocks.

Results

PP piglets consumed more EEM ($P<0.01$) and feed (+6.3%; $P<0.05$), and gained more weight (+9.7%; $P<0.01$) between day 0 and 9 post-weaning, and showed improved fecal scores between day 14 and 28 (6.24 vs. 5.99; $P<0.01$). Behavioral observations indicated more exploration (+1.3%; $P<0.05$; day 18), more play (+0.4%; $P<0.10$; day 8), and a trend toward reduced ear biting (-0.1%; $P<0.10$; day 8) in PP piglets. By day 28, PP showed a tendency for less piglets (-1.5%) with tail damage ($P=0.07$) and displayed reduced weight variation (-1.2%; $P=0.04$) compared with CS.

Discussion and Conclusion

The results imply that PP as EEM can support weaner piglet performance when gut health or biting issues occur on farm.

WEL-PP-30

TOWARDS A GRADUAL END TO TAIL DOCKING: THE EXPERIENCE OF TWO FRENCH EXPERIMENTAL FARMS

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Background and Objectives

The gradual phasing out of tail docking should be considered when tail biting is not observed. The aim is not to unilaterally stop tail docking, due to the risk of tail biting, but to progressively increase the proportion of pigs with intact tails on the farm.

Material and Methods

Since 2022, trials have been conducted at the Trinottières (T) and CIRI (R) experimental stations (France) to document the management of pigs with intact tails. Four batches of pigs were studied. The first two batches were used to develop observation and monitoring skills. Then, for batches B1 and B2, a strategy to reduce tail biting was applied: daily provision and replacement of three enrichment materials during biting episodes for B1; for B2 the same strategy was maintained at station T, whereas a handful of straw was provided twice daily at station R. Tail condition and interventions were recorded daily during post-weaning and fattening periods. Individual assessments were made three times during the post-weaning period and monthly during fattening. Slaughterhouse data were collected for undocked pigs and a sample of docked pigs.

Results

High variability was observed between stations, batches, and pens in the frequency of severely bitten pigs (tail scores 2 and 3). Less than 20% of pigs were severely bitten on each assessment day, but over 60% received this score at some point during rearing in three of four batches. Few carcass condemnations occurred at the slaughterhouse, though they tended to be more frequent in undocked pigs (0.9 vs 2.1%, respectively, $p<0.1$).

Discussion and Conclusion

The intervention strategy was not consistently effective. Short sequences of enrichment sometimes halted tail biting, but longer episodes highlighted the importance of timely intervention. The seizure at slaughter criterion requires clarification on larger sample sizes, as literature suggests a higher risk of carcass seizures when tail biting occurs.

WEL-PP-31

IMPACT OF LAWSONIA INTRACELLULARIS VACCINATION ON TAIL-BITES AND RELATED DISEASES, EVALUATED BY ANTIMICROBIAL TREATMENTS AND SLAUGHTERHOUSE REMARKS IN FINNISH HERDS

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Background and Objectives

Lawsonia intracellularis (LI) causes porcine proliferative enteropathy, vaccination is a common control. Tail-biting is a multifactorial problem in pigs leading to secondary lesions as abscesses, arthritis and carcass losses. Previous studies suggest that improved health, including gut health and LI-vaccination, may reduce the risk of tail-biting.
The aim of this study was to investigate whether LI-vaccination (Porcilis®Lawsonia) impacted the prevalence of tail-bites and associated health problems using antimicrobial treatment and slaughterhouse remarks as outcome parameters in commercial, non-tail-docking herds.

Material and Methods

Data from six finisher herds delivering pigs to one slaughterhouse were analyzed.
Antimicrobial treatments (four herds) and potential tail-bite-related slaughterhouse remarks (tail-bites, abscesses, arthritis, condemnations; six herds) were compared between two seasonally matched six-month-periods before and after LI-vaccination.

Results

Antimicrobial data was found to only contain diagnoses potentially related to tail-biting. Treatments for tail-bites alone increased slightly after versus before LI-vaccination (+1.9%-points) though not reported in all herds. However, the overall proportion of pigs treated decreased by –2.9%-points (range: –10.7 to +2.3). Most notably, total antimicrobial consumption (ml/animal) decreased in three of four herds, averaging –29.7% (range –65.6% to +39.6%) after LI-vaccination.
Tail-bite remarks were consistently low and below 6.2% (avr.: 2.0%; range: 0 to +6.2) with a negligible average change (–0.02%-points; –0.8 to +0.4). Slight increases were noted in carcass condemnations (+1.4; 0.2-3.6), abscesses (+0.2; –0.9-1.4), arthritis (+0.2; –0.6-1.0), and total remarks (+1.8; –1.0-3.8).

Discussion and Conclusion

Antimicrobial treatments showed clear reductions in both treated animals and total antimicrobial consumption after LI-vaccination. Slaughterhouse remarks may misjudge tail-biting and do not express changes in severity, as wounds can heal before slaughter or severely affected pigs may not reach the abattoir. These findings indicate that LI-vaccination may indirectly reduce stressors predisposing to tail-biting, improve pig welfare, and decrease herd-level antimicrobial usage.

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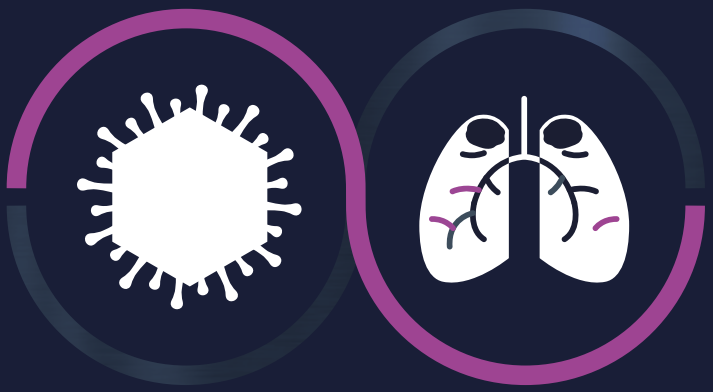

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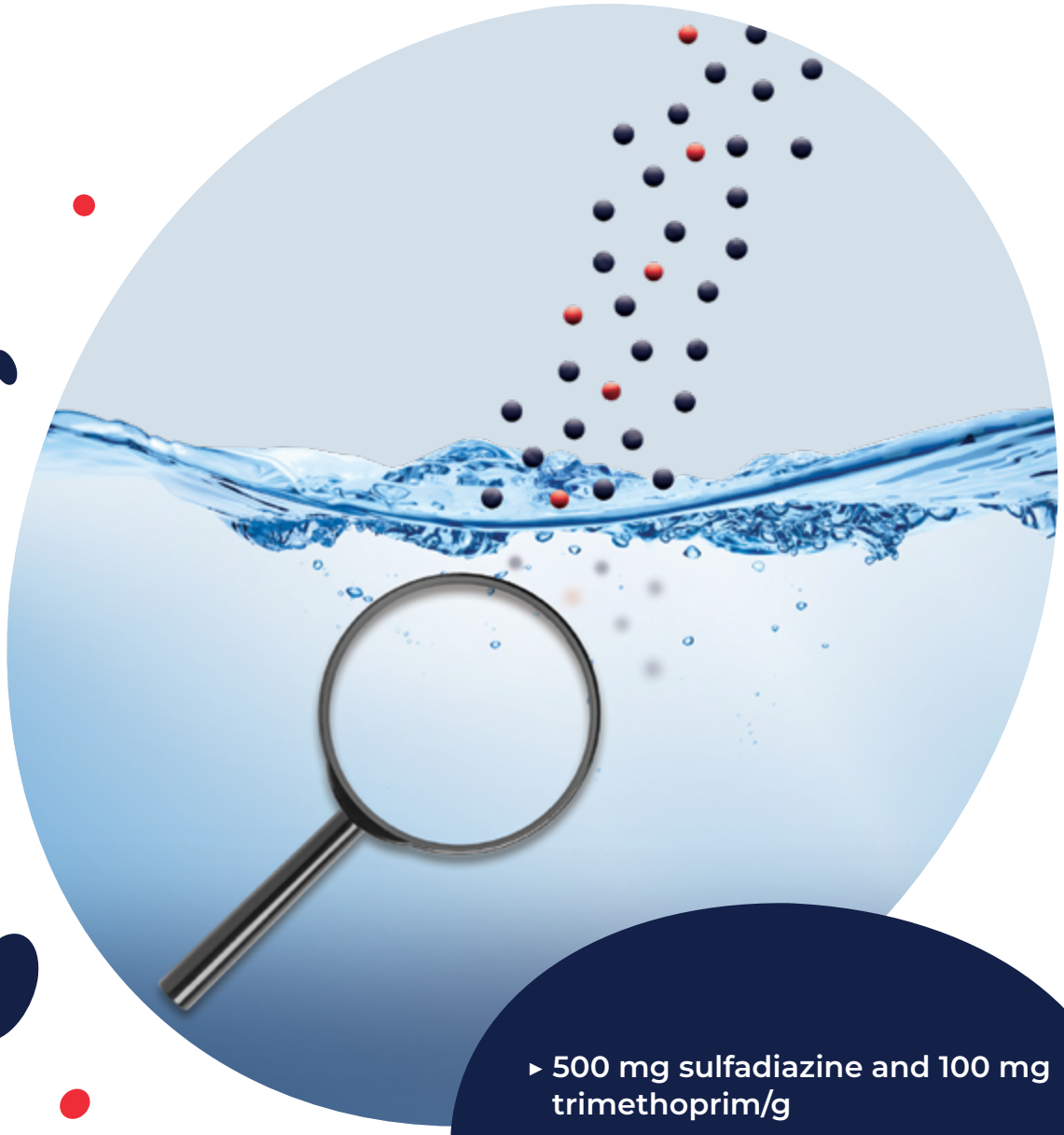

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